RSX–11M/M–PLUS
MCR Operations Manual

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PREFACE

MANUAL OBJECTIVES

The RSX-11M/M-PLUS MCR Operations Manual provides information needed to operate and control an RSX-11M/M-PLUS system. It supplies an introduction to the basic concepts of MCR and describes the use of MCR as the terminal interface with the RSX-11M/M-PLUS operating system.

The manual identifies two types of users: privileged and nonprivileged. MCR provides privileged users functions that control and modify system operation as well as functions that permit program development and system maintenance. MCR provides nonprivileged users only those functions required for program development and local maintenance.

INTENDED AUDIENCE

The RSX-11M/M-PLUS MCR Operations Manual does not attempt to train operators. The manual assumes that the reader is familiar with computer operating procedures, both real-time and batch, and that the reader has experience operating terminal devices.

An "operator" is broadly defined as anyone who interfaces directly with RSX-11M/M-PLUS to perform a task. This broad definition is used because of the many and varied settings in which RSX-11M/M-PLUS operates; some settings do not require an operator in the conventional sense of the term.

RSX-11S is a compatible subset system of RSX-11M/M-PLUS. Thus, this manual can also be used as a reference document for RSX-11S.

STRUCTURE OF THE DOCUMENT

Chapter 1 describes MCR and gives a summary of the commands.

Chapter 2 discusses basic concepts of the RSX-11M/M-PLUS file system (Files-11) and also describes many system conventions, such as device and task naming conventions.

Chapter 3 supplies detailed descriptions of all the MCR commands. The commands are in alphabetical order.

Chapter 4 discusses the indirect command processor (Indirect) and explains the use of indirect command files. Directives to the indirect command processor appear in alphabetical order.

Appendix A lists, in alphabetical order, the MCR and Task Termination Notification program (TKTN) messages that can be returned by the system.

ASSOCIATED DOCUMENTS

Other documents related to RSX-11M/M-PLUS are briefly described in the respective documentation directories.

Although the RSX-11M/M-PLUS MCR Operations Manual is primarily self-contained, the reader should be familiar with system generation options and features to understand the function of this manual in the context of RSX-11M/M-PLUS as a whole (see either the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide).

CONVENTIONS USED IN THIS DOCUMENT

A symbol with a 1- to 3-character abbreviation indicates that you press the corresponding key on the terminal, for example, RET or ESC.

The symbol CTRL/n indicates that you must press the key labeled CTRL while you simultaneously press another key: for example, CTRL/Z, CTRL/R, CTRL/U. In examples, these three control keys are shown as ^Z, ^R, ^U, respectively, because that is how the system echoes them.

Uppercase letters and words indicate that you should enter the letter or word exactly as shown. Lowercase letters and words indicate that you are to substitute a word or value.

Square brackets ([]) indicate optional entries in a command line or file specification. When you enter an option, the brackets are not included.

Square brackets are also a part of the User Identification Code and User File Directory syntax ([group,member]). When you use a UIC or UFD (in a file specification, for example), the brackets must be included.

Braces ({}) indicate a choice of required entries for a command line. You can use any of the entries enclosed in the braces, but you must specify one of them.

Red ink in examples indicates input that you type on the terminal.

Shaded portions of text describe only one operating system. Pink shading indicates that the text pertains only to RSX-11M systems. Gray shading indicates that the text pertains only to RSX-11M-PLUS systems.

INS — New keywords are:

/CLI	Installs a task as a command line interpreter. A CLI task must be installed before the CLI can be used.
/IOP	Specifies that a privileged task can overmap the I/O page.
/SEC	(RSX-11M-PLUS systems only.) Places in secondary pool the Task Control Block for the task being installed.
/TIME	(RSX-11M-PLUS systems with Resource Accounting only.) Sets a time limit for the task when it uses the CPU.
/XHR	(RSX-11M-PLUS systems only.) Specifies that the Executive's copy of the task's header will be in an area external to the system's dynamic storage area (pool).

LOA — Now correctly loads the KMC line printer driver with multiple controllers.

MOU — Now allows names with special characters in them for magnetic tape volumes.

New or revised keywords are:

/BS	Specifies block size for magnetic tape volumes.
/CC	Specifies record type for magnetic tape volumes.
/DENS	Now accepts 6250 bpi as a density for a TU78 magnetic tape.
/HDR3	Specifies whether an HDR3 label is to be written when creating new files.
/LABEL	Specifies whether a magnetic tape volume is in ANSI format (/LABEL) or unlabeled (/NOLABEL).
/LOCK	Specifies the default value for the DISMOUNT /LOCK keyword.
/OVRACC	Instructs the MOUNT command to override the protection for an ANSI magnetic tape volume.
/PRO	Specifies the volume protection for Files-11 disks.
/PUB	Makes the volume accessible to all users, depending on the volume and file protection set for the volume.
/RS	Specifies number of characters in a record for magnetic tape volumes.

MOU (Cont.)	/SHARE	Specifies whether more than one user can mount the volume (/SHARE) or if it can be used by only one user (/NOSHARE).
	/TR	Specifies the kind of character translation used in read and write operations on an unlabeled magnetic tape volume.
	/VOL	Specifies the Volume Identifier for an ANSI magnetic tape.
	/WAIT	Specifies whether operator assistance is required for performing a mount operation.
	/WIN	Now also accepts the following options: USER:n, INDEX:n, (USER:n,INDEX:n), and FULL.
	/WRITE	Specifies that a volume will be software write-enabled (/WRITE) or software write-locked (/NOWRITE).
OPE	New formats for displaying the contents of a location in memory: ASCII, single-character ASCII, Radix-50, double-byte, and decimal.	
	New keywords are:	
	/TASKD	(RSX-11M-PLUS systems only.) Accesses and prints the contents of addresses in the data space of an I- and D-space task.
	/TASKI	(RSX-11M-PLUS systems only.) Accesses and prints the contents of addresses in the instruction space of an I- and D-space task.
PAR	Now displays the address of a Partition Control Block (PCB). (This is new for RSX-11M.)	
REM	Now checks to see if an installed task is an active CLI. If so, it is not removed and an error message is displayed.	
RUN	New keywords are:	
	/CMD	Passes the specified command line to the task being run for processing.
	/EST	Specifies whether or not a task will wait for spawned tasks to complete and for RUN to emit exit status.
	/INC	Increments the address space allocated to a task that runs in a system-controlled partition.
	/IOP	Specifies that a privileged task can overmap the I/O page.
	/TIME	(RSX-11M-PLUS systems with Resource Accounting only.) Sets a time limit for the task when it uses the CPU.
SAV	A saved RSX-11M-PLUS system is now bootable on RSX-11M.	

SET — New or revised keywords are:

/ABAUD	Enables autobaud detection for a terminal's remote dial-up line.
/BRO	Specifies whether a terminal will receive messages sent by the BROADCAST command.
/CLI	Displays or sets the default command line interpreter for a terminal (or terminals).

INS — New keywords are:

/CLI	Installs a task as a command line interpreter. A CLI task must be installed before the CLI can be used.
/IOP	Specifies that a privileged task can overmap the I/O page.
/SEC	(RSX-11M-PLUS systems only.) Places in secondary pool the Task Control Block for the task being installed.
/TIME	(RSX-11M-PLUS systems with Resource Accounting only.) Sets a time limit for the task when it uses the CPU.
/XHR	(RSX-11M-PLUS systems only.) Specifies that the Executive's copy of the task's header will be in an area external to the system's dynamic storage area (pool).

LOA — Now correctly loads the KMC line printer driver with multiple controllers.

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New or revised keywords are:

/BS	Specifies block size for magnetic tape volumes.
/CC	Specifies record type for magnetic tape volumes.
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/HDR3	Specifies whether an HDR3 label is to be written when creating new files.
/LABEL	Specifies whether a magnetic tape volume is in ANSI format (/LABEL) or unlabeled (/NOLABEL).
/LOCK	Specifies the default value for the DISMOUNT /LOCK keyword.
/OVRACC	Instructs the MOUNT command to override th protection for an ANSI magnetic tape volume.
/PRO	Specifies the volume protection for Files-11 disks.
/PUB	Makes the volume accessible to all users, depending on the volume and file protection set for the volume.
/RS	Specifies number of characters in a record for magnetic tape volumes.

MOU (Cont.)	/SHARE	Specifies whether more than one user can mount the volume (/SHARE) or if it can be used by only one user (/NOSHARE).
	/TR	Specifies the kind of character translation used in read and write operations on an unlabeled magnetic tape volume.
	/VOL	Specifies the Volume Identifier for an ANSI magnetic tape.
	/WAIT	Specifies whether operator assistance is required for performing a mount operation.
	/WIN	Now also accepts the following options: USER:n, INDEX:n, (USER:n,INDEX:n), and FULL.
	/WRITE	Specifies that a volume will be software write-enabled (/WRITE) or software write-locked (/NOWRITE).
OPE	New formats for displaying the contents of a location in memory: ASCII, single-character ASCII, Radix-50, double-byte, and decimal.	
PAR	Now displays the address of a Partition Control Block (PCB). (This is new for RSX-11M.)	
REM	Now checks to see if an installed task is an active CLI. If so, it is not removed and an error message is displayed.	
RUN	New keywords are:	
	/CMD	Passes the specified command line to the task being run for processing.
	/EST	Specifies whether or not a task will wait for spawned tasks to complete and for RUN to emit exit status.
	/INC	Increments the address space allocated to a task that runs in a system-controlled partition.
	/IOP	Specifies that a privileged task can overmap the I/O page.
	/TIME	(RSX-11M-PLUS systems with Resource Accounting only.) Sets a time limit for the task when it uses the CPU.
SAV	A saved RSX-11M-PLUS system is now bootable on RSX-11M.	
SET	New or revised keywords are:	
	/ABAUD	Enables autobaud detection for a terminal's remote dial-up line.
	/BRO	Specifies whether a terminal will receive messages sent by the BROADCAST command.
	/CLI	Displays or sets the default command line interpreter for a terminal (or terminals).

SET (Cont.)	/DCL	Enables recognition of DIGITAL Command Language (DCL) commands. (This keyword is new for RSX-11M.)
	/MCR	Enables recognition of MCR commands. (This keyword is new for RSX-11M.)
	/NETUIC	Specifies the UIC in which all DECnet-related tasks are stored.
	/NOCEX	(RSX-11M-PLUS systems only.) On a pregenerated RL02 or RC25 system, deallocates Executive space reserved for DECnet support.
	/OPT	(RSX-11M-PLUS systems only.) Enables disk I/O queue optimization for a device.
	/PLCTL	Displays or sets the pool limit parameters used by the Pool Monitor Task (PMT).
	/REMOTE	Now allows the setting of the initial baud rate of a remote dial-up line for a terminal.
	/RNDC	Defines the length of the Executive round-robin scheduling interval. •
	/RNDH	Defines the highest priority that will be considered for Executive round-robin scheduling. •
	/RNDL	Defines the lowest priority that will be considered for Executive round-robin scheduling. •
	/SECPOL	(RSX-11M-PLUS systems only.) Displays secondary pool use in the system.
	/SERIAL	(RSX-11M-PLUS systems only.) Causes input from a terminal to be processed serially rather than in parallel.
	/SWPC	Defines the length of a single Executive swapping interval. •
	/SWPR	Defines a priority range for Executive swapping. •
	/TERM	New terminal types allowed: LA12, LA34, LA38, LA100, VT101, VT102, VT105, VT125, VT131, VT132.
	/TOP	Moves the top boundary of a system-controlled partition.
STP	The STOP command has been replaced by the BLOCK (BLK) command.	

TAS	Now accepts a task-name parameter. New keyword: /DEV, which displays information about tasks installed from a particular device.
UNB	New command. Continues execution of a task previously stopped with the BLOCK command.

Indirect Command Processor (Indirect)

Indirect now accepts directives and command lines in lowercase as well as in uppercase.

The following are new or revised directives:

.ASK	Now allows a default value and a timeout parameter to be specified in the command line.
.ASKN	Now allows a timeout parameter to be specified in the command line.
.ASKS	Now allows a default value and a timeout parameter to be specified in the command line.
.DATA	Now also allows a TAB after the command.
.ENABLE/ .DISABLE	New options for enabling and disabling are (default setting and default action):

ATTACH	Enabled: Indirect attaches to TI: for comment lines.
CONTROL-Z	Disabled: Indirect exits when CTRL/Z is used in response to a .ASKx directive.
DECIMAL	Disabled: numeric symbols are created or redefined as octal.
DELETE	Disabled: the current command file is not deleted when Indirect exits.
DETACH	Enabled: Indirect detaches from the terminal when processing command lines.
DISPLAY	Enabled: Indirect displays the current fields for the .ASKx directives and "@ <EOF>".
ESCAPE-SEQ	Disabled: Indirect does not attach to the terminal for escape-sequence recognition.
MCR	Enabled: commands not processed by Indirect are passed to the default command line interpreter (CLI) of the terminal.
OVERFLOW	Disabled: signed arithmetic in numeric expressions is not allowed.

.ENABLE/ .DISABLE (Cont.)	TIMEOUT	Enabled: Indirect uses the timeout parameters specified for the .ASKx directives.
	TRACE	Disabled: commands processed by Indirect are not displayed on the terminal.
	TRUNCATE	Disabled: truncate errors on a .READ directive are not ignored.
	The GLOBAL option is now enabled by default.	
.ERASE SYMBOL	Deletes a symbol from the global symbol table.	
.IF ENABLED/ DISABLED	Tests the .ENABLE/.DISABLE options.	
.FORM	(RSX-11M-PLUS systems only.) Allows FMS command lines to be passed to FMS.	
.OPENR	Opens a file for reading with the .READ command.	
.PARSE	Parses strings into substrings.	
.READ	Reads a record from a file into a specified string variable.	
.SETD/.SETO	Redefines the radix of a numeric symbol.	
.SETL	Defines or redefines a logical symbol and assigns the symbol a true or false value.	
.TEST	Now also locates a substring.	
.TESTDEVICE	Returns information about a device in the system.	
.TESTFILE	Determines if a specified file exists and determines the physical device associated with a logical name.	
.TESTPARTITION	Returns information about a partition in the system.	

The following are new or revised symbols:

<ACCOUN>	(RSX-11M-PLUS systems only.) Returns information from a user's accounting block.
<ALTMOD>	Tests whether the last question was answered with an ALTmode or an ESCape. Synonymous with <ESCAPE>.
<BASLIN>	Tests if the current operating system is a baseline configuration.
<CONFIG>	Contains the parameter defaults specified when the current Indirect task was built.
<EOF>	Tests whether the last .ASKx or .READ directive resulted in reading past the end of the file.
<ERRCTL>	Controls Indirect processing upon encountering an error.

<ERRNUM>	Contains the class number of an error that Indirect has finished processing.
<ERROR>	One of five symbols that define the exit status of an executed CLI-specific command line. The other symbols are <SEVERE>, <SUCCES>, <WARNIN>, and <NOSTAT>. These symbols are associated with the numeric codes for <EXSTAT>.
<ERRSEV>	Contains the error severity mask associated with the error that Indirect has finished processing.
<ERSEEN>	Tests the error code of a file, the exit status of an executed CLI-specific command line, if <EOF> is true, the value for <ERRNUM>, or if the .SETT directive was used.
<EXSTRT>	Contains build-time information about the Indirect task or the string results from a more deeply nested indirect command file. The results are sent to the calling indirect command file.
<FALSE>	Logical constant used for comparisons with the .IF directive or as a default for the .ASK directive.
<FILATR>	Returns the seven words of file attribute information contained in the FCS-11 File Descriptor Block (FDB).
<FILERR>	Contains the FCS-11 or I/O driver status code resulting from a .TESTFILE, .OPENx, or .READ directive operation.
<FILER2>	(RSX-11M-PLUS systems only.) Contains the second error code word returned by the FMS-related commands.
<FILSPC>	Contains the fully qualified specification for a file referred to with the last .OPENx or .TESFILE directive operation or in the last specification for a nested command file.
<FMASK>	Contains octal values that represent answers to some of the system generation questions.
<FORATT>	Contains the octal value of the file attributes used to open the data files.
<IAS>	Tests whether the current system is IAS. Synonymous with <RSX-11D>.
<LOCAL>	Tests whether the terminal from which Indirect is running is a local terminal.
<LOGDEV>	Contains the device name and unit number of the user's login account or SY0:.
<LOGUIC>	Contains the login UIC of the current user or the current default UIC.
<NETUIC>	Contains the UIC in which DECnet-related tasks are stored.

<NETNOD>	Contains the DECnet node name for the system or RSX-11.
<NOSTAT>	One of five symbols that define the exit status of an executed CLI-specific command line.
<NUMBER>	Tests whether the last string entered in response to an .ASKS directive or tested with a .TEST directive contains only numeric characters.
<OCTAL>	Tests whether a value used in a .ASKN or .TEST directive operation is octal.
<PRIVIL>	Tests whether the current user is privileged.
<SEVERE>	One of five symbols that define the exit status of an executed CLI-specific command line.
<SUCCES>	One of five symbols that define the exit status of an executed CLI-specific command line.
<SYMTYP>	Contains the numeric code for the type of symbol tested with a .TEST directive.
<SYSDEV>	Contains the physical device name of the boot device for the system.
<SYSID>	Contains the base-level number for the system.
<TICLPP>	Contains the current page length setting for the terminal.
<TICWID>	Contains the current page width setting for the terminal.
<TIMOUT>	Tests whether the last .ASK directive timed out waiting for a user response.
<TISPED>	Contains the baud rate for host-to-terminal character transmission.
<TITYPE>	Contains the terminal type of the terminal from which Indirect is running.
<TRUE>	Logical constant used for comparisons with the .IF directive or as a default for the .ASK directive.
<WARNIN>	One of five symbols that define the exit status of an executed CLI-specific command line.

The following are new switches:

/[NO]CLI	(/CLI default) Passes commands not processed by Indirect to the default command line interpreter (CLI) for the terminal. Synonymous with /[NO]MC.
/LB	Indicates that the specified file is a universal library of command procedures and that the specified module is the procedure to be executed.

/LO — (/NOLO default) Indicates that when a new file is executing, it can have access to the local symbols created by its calling command file, and that any local symbols created by the new command file will be defined as local symbols for the calling command file.

The following is new functionality in Indirect:

Parameter passing

Parameters for a command file can now be passed to Indirect for processing. The parameters are stored in the reserved local symbols P0, P1, P2, P3, P4, P5, P6, P7, P8, P9, and COMMAN.

Universal library support

When command procedures which are indirect command files, are inserted into a universal library with the Librarian Utility Program (LBR), they can then be referenced with the new /LB:module switch.

Command libraries are built by creating a universal library and inserting command files into it. The procedures in the library can then be referenced in the form @command-library/LB:module.

Substitution format control

Format control is available for numeric values being converted to string values and for string and logical values being placed in a substitution operation.

CHAPTER 1

INTRODUCTION TO MCR

The Monitor Console Routine (MCR) serves as an interface between you and the RSX-11M/M-PLUS system. You issue MCR commands from a terminal.

Before trying to use MCR commands, be sure that your terminal is set to MCR. You can verify this by pressing CTRL/C and getting the explicit MCR prompt (see Section 1.1.1). If you would like MCR to be the default command line interpreter for your terminal, have your system manager set this up for you in the account file.

1.1 MCR COMMAND LINES

To issue an MCR command, type a command line in response to a default (>) or explicit MCR (MCR>) prompt. A command line consists of three components: a command name, any required parameters, and a line terminator.

It is not necessary to type the entire command name when submitting a command. MCR requires only the 3-letter abbreviation for a command name, except for HELP, which must be entered in full. The command name is then followed by the command parameters.

For example, you can type the CANCEL command as follows:

```
>CAN taskname RET
```

The variable taskname is a parameter for the CANCEL command and RET signifies the RETURN key, the line terminator. As in this example, the command you use often consists of the first three letters of the command name. Some commands, however, have 3-letter acronyms as command names. For instance, the names for the ASSIGN and USER FILE DIRECTORY commands are ASN and UFD, respectively.

With most of the commands, you can specify a longer form of the command name. This is unnecessary, however, because MCR only uses the required three letters, but to make the intent of the command clear to someone reading a printed copy of command input, you can type:

```
>CANCEL taskname RET
```

A space or a tab signals the end of the command name; therefore, no spaces or tabs are allowed within the command name itself. For example,

```
>OPENREGISTER address
```

is permissible, while

```
>OPEN REGISTER address
```

is not.

Typically, a command parameter is a task name, the name of a file, or a device specification. A parameter can be modified by a keyword (defined in Section 1.1.2).

You press the RETURN key (RET) or the ALTmode or ESCape key (ESC) to terminate a command line. MCR returns the default prompt after processing a command line terminated by pressing the RETURN key. MCR suppresses the default prompt after processing a command line terminated by the ESCape key, except when the ESCape key has special significance as a terminator (with the RUN and OPENREGISTER commands, for example). MCR accepts subsequent unsolicited input even though the default prompt does not appear.

When MCR parses a command line, it normally compresses any multiple spaces and tabs and treats character strings beginning with a semicolon (;) or an exclamation mark (!) as comments (see Section 1.1.3).

When you use quotation marks ("") in the command line, however, MCR parses that part of the line within the quotes exactly as you typed it. No compression occurs. This allows you to use special characters in your command line and to use American National Standard (ANSI) X.327-1978 file specifications, which can have embedded spaces.

If you use only one quotation mark in the command line, MCR assumes an ANSI file specification and does not compress the line past the quotation mark. (See the RSX-11M/M-PLUS I/O Operations Reference Manual for more information on support for quotation marks.)

On RSX-11M-PLUS, you can also use a hyphen (-) as the character immediately before the terminator to extend a command line. A hyphen followed by a line terminator returns the prompt "->". You then enter the remainder of the command line. You can enter any number of such continuation lines, but the total command line cannot exceed 255(10) characters. This feature is especially useful when selected keywords or options cause the command line to exceed 80 characters.

For example,

```
>INI DK1:ICTSVOL2/UIC=[2,5]-(RET)
->/INDX=BEG-(RET)
->/EPRO=[RWED,RWE,RW,R](RET)
```

has the same effect as entering the entire command on one line.

1.1.1 The MCR Prompt

When you use MCR, there are three prompts that indicate a terminal is waiting for input from you: the default prompt, task prompts, and the explicit MCR prompt. The default prompt and task prompts are described more fully in Chapter 2.

A terminal always sends to MCR any input typed in response to the explicit MCR prompt (MCR>):

```
MCR>command-input
```

You invoke the explicit MCR prompt by pressing the CONTROL (CTRL) key and the C key simultaneously.

However, CTRL/C does not invoke the MCR prompt in a special case as described in the second item in the following list. The description of CTRL/C in Table 2-2 also describes two other situations in which CTRL/C does not invoke the explicit MCR prompt.

The following notes explain various uses of the explicit MCR prompt:

1. When a terminal is displaying the default prompt (>), there is no guarantee that input typed in response to the prompt will be directed to MCR because another task may have attached to the terminal. To ensure that MCR does receive the input, press CTRL/C to invoke the MCR prompt. After MCR processes the command line, the terminal will display the default prompt.

2. When a terminal is displaying a task prompt (tsk>), you can invoke MCR by pressing CTRL/C. After (or while) MCR processes the command line, the terminal will display the original task prompt.

   If you requested MCR to display information (with the TIME command, for example) and it is not displayed before the task prompt appears, press the RETURN key. This will display the information and then the original task prompt. Also press the RETURN key if you would like to know if MCR processed the command line or if it returned an error message.

   NOTE

   If an attached task specifies an Asynchronous System Trap (AST) upon receiving unsolicited input, CTRL/C causes an AST to occur, thereby gaining the task's attention rather than MCR's. Consequently, the MCR prompt does not appear.

3. When any terminal is receiving output from a task, you can interrupt the output by pressing CTRL/C. At the completion of the current I/O operation, the terminal displays the explicit MCR prompt. After MCR processes the command line directed to it, the system resumes the interrupted output.

In all three cases, if the command line invokes a task, the task will issue its own prompt. You can respond to this prompt with another CTRL/C, which invokes the MCR prompt. You can then request another task that issues its own prompt and so on. (Note that because CTRL/C does not abort the task that was active when you typed the CTRL/C, it is possible to have several tasks active at your terminal concurrently.)

1.1.2 Keywords

Some of the MCR commands use keywords that affect a command parameter. Keywords are similar in function to switches (described in Section 2.2). A keyword consists of a slash (/), followed by an alphanumeric name, and optionally followed by an equal sign (=) and the value for the keyword, as follows:

```
/keyword=value
```

A keyword modifies the action of a command. You can apply a keyword directly to the command or to a command parameter, depending on the command. If the keyword follows the command name, it modifies the action of the command. If the keyword follows a parameter, it modifies the action for the parameter.

For example, the INSTALL command requires a file name parameter that specifies the task to be installed. You can append keywords to this file name. One such keyword, /TASK, specifies the name under which the task is to be installed. For example:

```
>INS BOB.TSK/TASK=AMBER
```

This command installs the task image file BOB.TSK with the name AMBER. When you want to use the task, you invoke it with the name AMBER.

You can enter keywords in any order. They are command-specific and are defined in the descriptions of the commands (Chapter 3).

1.1.3 Comments

MCR treats a line of text as a comment if the first character in the line is a semicolon (;). In addition, you can use the exclamation point (!) to delimit comments within a command. The first exclamation point starts the comment and the next exclamation point or line terminator ends the comment. MCR ignores all text between the two exclamation points. For example:

```
>;  THIS LINE IS A COMMENT

>TAL !THIS IS A COMMENT STRING!  RMDEMO
```

Comments are especially useful to clarify commands in indirect command files, which are described in Chapter 4.

To use the semicolon and exclamation point characters in the command line, use quotation marks (see Section 1.1).

1.2 THE MCR INTERFACE

MCR parses the input you type to determine what the command line is requesting and then responds appropriately to the input. To service a request, MCR either uses an MCR overlay or activates an independent task.

By following the procedures outlined in the following text, MCR activates the appropriate overlay or task to service each command.

The required three letters of the command name are the most significant part of a command line. MCR uses the name to determine the necessary overlay or task as follows:

1. MCR searches a table containing names of commands serviced by MCR itself. If the table contains a matching command, MCR either loads the corresponding overlay or starts the secondary task (...MCR), which invokes the correct overlay. The overlay then proceeds to process the command line. (On single-user RSX-11M systems, all commands are serviced by MCR..., the primary MCR task. There is no secondary MCR task.)

2. If the table does not contain a matching command, MCR prefixes three dots (...) to the command name and then searches the System Task Directory (STD) for a task by that name (that is, ...tsk). MCR returns an error if the STD does not contain the specified task.

On RSX-11M systems, MCR displays a "Task active" message if ...tsk is already active at the terminal. If the STD contains ...tsk and it is not running at the issuing terminal, MCR responds conditionally in one of two ways:

- If ...tsk is not active, MCR requests the Executive to run the task at the issuing terminal.

- If ...tsk is active, MCR creates a temporary STD entry that points to the active task's disk image. MCR names the temporary task tskTnn, where nn is the unit number of the terminal that issued the command. If task tskTnn is already installed, MCR requests the Executive to run that version of the task at the issuing terminal. When tskTnn exits, the Executive automatically deletes its STD entry.

On RSX-11M-PLUS systems, MCR first looks for an installed version of tskTnn and requests the Executive to run it. If one does not exist, MCR creates a temporary STD entry, names the task tskTnn, and then requests the Executive to run the task. When tskTnn exits, the Executive automatically deletes its STD entry.

1.3 MCR COMMAND SUMMARY

The MCR commands described in Chapter 3 are listed here by category. This command summary provides a compact overview of the facilities available at your terminal. Commands followed by (NP) are available to all users. Commands followed by (P) are available only to privileged users. Commands followed by (NP,P) are nonprivileged commands with privileged options. Commands followed by (P,NP) are privileged commands with nonprivileged options.

Initialization Commands

ACS (P)	Allocate or discontinue the use of a checkpoint file on disk.
ASN (NP,P)	Define or delete a logical device assignment. Display current assignments on your terminal.
BOOT (P)	Bootstrap a new system into memory and transfer control to it.
DMOUNT (NP,P)	Dismount a volume by marking the volume for dismount and releasing its control blocks (complement of MOUNT).
FLAGS (NP,P)	Create, display, or eliminate group global event flags.
HOME (NP,P)	Alter the values contained in various fields of the home block of a Files-11 disk volume.
INITVOLUME (NP)	Initialize a disk, DECtape, or magnetic tape to produce a Files-11 volume.
INSTALL (P)	Install a task in the system.
LOAD (P)	Load a nonresident device driver into memory.
MOUNT (NP,P)	Mount a volume by creating its control blocks and declaring the volume on-line for access by the file system.
REDIRECT (P)	Redirect all I/O requests from one physical device to another.
SET (NP,P)	Alter or display system, device, or task characteristics.
TIME (NP,P)	Enter the time and date into the system. Display the time and date on your terminal.
UFD (NP,P)	Create a User File Directory (UFD) in a Master File Directory (MFD) on a Files-11 volume.

Informational Commands

ACT (NP)	Display on your terminal the names of active tasks that were requested from that terminal.
ATL (NP)	Display on your terminal the names and status information for active tasks.
CBD (NP)	(RSX-11M-PLUS systems only.) Display on your terminal the names and status information for entries in the Common Block Directory.
CLQUEUE (NP)	Display on your terminal information about tasks i the clock queue.
DEVICES (NP)	Display on your terminal information about peripheral devices recognized by the system.
LUNS (NP)	Display on your terminal the list of static logical unit number (LUN) assignments for a specific task.

PARTITIONS (NP)	Display on your terminal a description of each partition in memory.
TAL (NP)	Display on your terminal the names and status of all tasks in the system or the name and status of a specific task.
TASKLIST (NP)	Display on your terminal a description of each installed task.

Task Control Commands

ABORT (NP,P)	Terminate execution of a running task.
ALTER (P)	Alter the priority of a task.
BLOCK (NP,P)	Block a task.
CANCEL (NP,P)	Cancel time-based initiation requests for a task (no effect on current execution).
DEBUG (NP,P)	(RSX-11M-PLUS systems only.) Force a task to trap to a debugging aid.
FIX (P)	Fix a task in a partition in memory (the task becomes memory-resident).
REASSIGN (P)	Change logical unit number (LUN) assignments for a task.
REMOVE (P)	Remove a task from the system (complement of INSTALL).
RESUME (NP,P)	Resume execution of a suspended task.
RUN (NP,P)	Initiate the execution of a task. The task may run immediately, after a time delay, or in synchronization with the system clock. Periodic rescheduling is optional.
UNBLK (NP,P)	Unblock a previously blocked task (complement of BLOCK).
UNFIX (P)	Make a memory-resident task nonresident (complement of FIX).
UNLOAD (P)	Remove a loadable device driver from memory (complement of LOAD).
UNSTOP (NP,P)	Resume execution of an internally stopped task.

System Maintenance Commands

BRK (P)	Pass control to the Executive Debugging Tool (XDT). Valid only for systems that have generated XDT support.
OPEN (P)	Display on the entering terminal the contents of a memory location for examination or modification.
SAVE (P)	Copy the current system image into the system image file from which the system was booted.

SSM (P)	Insert text into the error log file.
SWR (P)	(RSX-11M-PLUS multiprocessing systems only.) Display the current value of, or set or clear a bit in the switch register.

Multiuser Protection Commands

ALLOCATE (NP,P)	Allocate a device to a user (establishes the device as the user's private device).
BRO (NP,P)	Broadcast a message to one terminal or to a set of terminals.
BYE (NP)	Log out of the system.
DEALLOCATE (NP,P)	Deallocate a private (allocated) device (complement of ALLOCATE).
HELLO or LOGIN (NP)	Log in on the system.
HELP (NP)	Display the contents of a help file.

Command Line Interpreter Commands

CLI (P,NP)	Work with a command line interpreter (CLI) other than MCR.
DCL (NP)	Issue a DIGITAL Command Language (DCL) command from a terminal set to MCR.

CHAPTER 2

SYSTEM CONVENTIONS

This chapter discusses basic concepts of the RSX-11M/M-PLUS Files-11 file system and highlights aspects of file handling that directly relate to user functions. The chapter also discusses devices, terminals, and tasks. The last section discusses briefly the Account File Maintenance Program (ACNT).

2.1 FILES-11

RSX-11M/M-PLUS includes a software system called Files-11 to oversee the storage and handling of files. In RSX-11M/M-PLUS, a file is an owner-named area on a volume, and volumes are magnetic media such as disks, DECtape, and magnetic tapes. Two RSX-11M/M-PLUS utilities and three MCR commands help you to prepare volumes for use with Files-11:

- Disk Volume Formatter Utility (FMT)
- Bad Block Locator Utility (BAD)
- INITIALIZE VOLUME (INI)
- MOUNT (MOU)
- USER FILE DIRECTORY (UFD)

The utilities are described in the RSX-11M/M-PLUS Utilities Manual. The commands are described in Chapter 3 of this manual.

Files-11 supports three types of specially formatted volumes: disks, DECtapes, and magnetic tapes. (Files-11 magnetic tapes conform to the American National Standard X3.27-1978.)

For a volume to become a Files-11 volume, you must initialize it with the INI command. A volume that has not been initialized by INI is a "foreign" volume. On RSX-11M, foreign volumes do not have to be mounted for you to work with them (although it is wiser to mount them for protection purposes); on RSX-11M-PLUS, the volumes must be mounted as foreign (MOUNT /FOR).

A system utility called the File Transfer Utility Program (FLX) allows you to access foreign volumes in DIGITAL's DOS-11 or RT-11 format. FLX translates files on such volumes into Files-11 format. In most cases, a DECtape will have a foreign format and therefore require the use of the FLX utility. See the RSX-11M/M-PLUS Utilities Manual for a full description of FLX.

Before Files-11 can access a file, the volume that contains the file must be known to the system. You make a Files-11 volume known to the system by issuing the MOUNT command for the device on which the volume is loaded.

2.1.1 File Ownership and Directories

When you create a file, the system places the file name in a User File Directory (UFD) and stores your current User Identification Code (UIC; see Section 2.2.1) in the file header to indicate that you are the owner of the file. In most cases, the UFD corresponds to your UIC, but a file can be listed in a UFD that is not related to your UIC. It is also possible for your file to be listed simultaneously in more than one UFD. (The files will have different file-IDs.)

Each user has a default UFD corresponding to his or her UIC. The UFD is on a default system device (SY:), which is specified by the system manager when the user's account is created.

A UFD is itself a file, which you must explicitly create by means of the MCR UFD command (see Chapter 3). You specify a UFD in the format [g,m] where g and m are octal numbers in the range 1 through 377 (0 is reserved). The numbers represent the file owner's group and member number, respectively. The actual name of the UFD is a concatenation of the group and member numbers, terminated by .DIR. For example, the name of the directory that corresponds to the UFD [203,65] is 203065.DIR. (Note that leading zeroes are added to the UFD to make g and m three digits each.)

All UFDs on a volume are listed in the volume's Master File Directory (MFD), which corresponds to UFD [0,0] and is therefore named 000000.DIR. The directories (the UFDs and the MFD) list the names of files and contain pointers to each file's header. The file header contains information about the file's owner and the physical location of the file segments; the header occupies one or more blocks of the volume's index file ([0,0]INDEXF.SYS).

To delete a UFD, you can use the Peripheral Interchange Program (PIP) to first delete all of the files contained in the UFD (thereby freeing the space for future use) by typing:

```
PIP>[g,m]*.*;*/DE
```

After you delete all the files, use PIP to delete the UFD by typing:

```
PIP>[0,0]gggmmm.DIR;*/DE
```

The variable gggmmm is the concatenation of the group and member number components of the appropriate UFD.

Refer to the RSX-11M/M-PLUS Utilities Manual for a detailed description of PIP.

2.1.2 File Protection

To access a file, you must know the UFD in which it is listed. This knowledge, however, is not sufficient to guarantee access. You must also satisfy conditions specified in a protection mask associated with the file you wish to access. The volume that contains the file must be mounted before the file system can access the file.

Every file has a protection mask that describes the types of access allowed to each of four user groups. RSX-11M/M-PLUS allows four types of access:

Read	The user, or the user's task, may read, copy, print, or type the file, and, if it is a task, run it.
Write	The user, or the user's task, may add new data to the file by writing to space already allocated to the file.
Extend	The user, or the user's task, may change the amount of disk space allocated to the file.
Delete	The user, or the user's task, may delete the file.

The four user groups are defined by UIC:

System	The operating system itself and privileged users (those having group numbers of 10 octal or less).
Owner	The user having the same UIC as the one the file was created under.
Group	All users having the same group number as the one the file was created under.
World	All users.

A file owner assigns access rights by one of the following means:

INI	This command allows you to specify default file protection for all files subsequently created on the initialized volume.
UFD	This command establishes access rights to a UFD file only. A user often allows read access to a UFD but denies write, extend, or delete access to the files listed within it.
MOUNT	This command allows you, while mounting a volume, to specify the default file protection to be given to files created on the volume. This protection overrides the protection established with the INI command.
PIP	This utility has an option that enables the owner to alter access rights to files.

To gain access to a file, a user must satisfy the protection mask of both the file to be accessed and the UFD in which the file is listed. For example, to write to an existing file, you need at least read access to the UFD and write access to the file. To create a new file, you need both write and extend access to the UFD.

2.2 FILE SPECIFICATIONS

MCR uses a standard format for referring to files in a command line. The format is a string consisting of one or more input and output file specifications, as follows:

```
outfile1...,outfilen=infile1...,infilen
```

The variable outfile is an output file specification and infile is an input file specification. The dots (...) indicate that you may include any number of file specifications in the string, the number being determined by the receiving command or task. The command line (the line of file specifications plus the task or command name) cannot exceed 80 characters (or, for half-duplex terminals, the maximum buffer size set for your terminal).

However, on RSX-11M-PLUS, you can extend any command line by appending a hyphen to the end of the command line. When you use continuation lines, the total length cannot exceed 255(10) characters.

Some commands and tasks may not require the outfile portion. When it is omitted, you might also be able to omit the equal sign (=).

The individual file specifications (whether input or output) have the following format:

```
ddnn:[g,m]filename.type;version/switch1.../switchn
```

ddnn:

Specifies the physical or logical device unit on which the volume containing the file resides. The device unit is expressed as a 2-character alphabetic device name and an optional 1-, 2-, or 3-digit octal unit number, followed by a colon (for example, TT104: or LP1:). If you do not specify a unit number, it defaults to 0. The default device is your system device (SY:).

[g,m]

Specifies the User File Directory (UFD) in which the file is listed. The variables g and m are octal numbers from 0 through 377 that represent the file owner's group and member number, respectively. The square brackets are a mandatory part of the UFD syntax. The default is the current User Identification Code (UIC; see Section 2.2.1) to which your terminal is set.

filename

Specifies the name of the file, an alphanumeric string from 0 through 9 characters in length (however, there are exceptions to this, depending on what program you are working with). A period always separates the file name from the file type. You must specify the file name. No default is applied.

If you want to include special characters in the file name (for example, semicolons or exclamation marks), place quotation marks around the name so that MCR will parse the name exactly as you typed it. If you use only one double quotation mark, MCR assumes an ANSI magnetic tape file name and parses the name as such. (See Section 1.1 for more information on using quotation marks.)

type

Consists of a 1- through 3-character alphanumeric mnemonic that identifies the nature of the file's contents, or it can be null. For example, .FTN indicates that the file contains a FORTRAN source program and .OBJ indicates that the contents are object (compiled) code. Some conventional and default RSX-11M/M-PLUS file types are listed in Section 2.2.4. A semicolon (;) always separates the file type from the version number.

version

Consists of an octal number from 1 through 77777 that distinguishes various versions of a file. For example, when a file is created, the system assigns it a version number of 1 by default. Thereafter, each time the file is opened and, unless you specify otherwise, the file system creates a new file with the same file name and file type, but with a version number incremented by one. Note that if a file has a version number of 77777, no more versions of it can be created.

The numbers -1 and 0 have special significance: -1 implies the lowest existing version of a file and 0 implies the highest existing version.

The default is the highest version of the file.

/switch (or /keyword)

Consists of an ASCII name that identifies a task or command option. Options generally modify the task's function in some way or provide information that the task needs to respond correctly to the command line.

The switch itself can be in one of three forms:

/sw	Sets the switch action.
/-sw	Negates the switch action.
/NOsw	Negates the switch action.

The number of values permitted and the interpretation of a switch depend on the task to which the switch is directed.

You can also modify switches with arguments. These arguments may be ASCII strings, octal numbers, or decimal numbers. The following rules apply:

- Numbers terminated by a decimal point (.) are decimal.
- Numbers preceded by a pound sign (#) are octal.
- Whether the default for a numeric value is octal or decimal depends on the command or task to which the switch is directed and on the switch itself.
- You can precede any numeric value by a plus (+) or minus (-) sign; plus is the default.
- A plus or minus sign, if present, must precede the pound sign (#) of an explicit octal number (for example, -#323).

2.2.1 User Identification Codes (UICs)

On RSX-11M systems that do not support multiuser protection, each terminal has, at any one time, one User Identification Code (UIC). A terminal's associated UIC is determined by the last SET /UIC command issued for the terminal, or is [200,200] if the terminal's UIC has not been altered since system generation.

The system uses the current UIC of the issuing terminal whenever you omit the UIC field of a file specification. The system also checks this UIC against the protection mask of any file that you want to access; the check determines access rights to the file (see Section 2.1.2).

On multiuser protection systems, a terminal has two UICs: a protection UIC and a default UIC. The system checks the protection UIC against a file's protection mask to determine a user's access rights to the file. The default UIC determines the UFD of the file to be accessed whenever you omit the UIC field in the file specification. (See Section 2.1.1 for more information on UFDs.)

How the system sets these two UICs depends on the privilege status of the user logged in at the terminal. When a nonprivileged user logs in, the terminal assumes the user's login UIC as its protection UIC. The login UIC also becomes the initial default UIC for the terminal. You can issue the SET /UIC command to alter the default UIC, but the protection (login) UIC remains unchanged.

When a privileged user logs in, the terminal also assumes the login UIC as the protection and default UICs. However, when you issue the SET /UIC command, the system alters both of these UICs instead of just the default UIC. Because the protection UIC is also changed, the system no longer knows your login UIC. (This does not apply to RSX-11M-PLUS systems on which Resource Accounting is active because the accounting system keeps a record of every user's login UIC.)

2.2.2 Wildcards

Wildcards allow you to specify more than one file in a single specificaton by placing them in one or more fields of the specification. A wildcard causes the system to ignore the contents of the wild field and to select all the files that satisfy the remaining explicitly specified fields.

Asterisk wildcards (*) can be used in any part of the file specification except the device-unit field, which must be explicitly supplied or defaulted to SY: (see Section 2.2.3). The following examples illustrate the advantage of using the asterisk wildcard:

```
PIP>PROG.MAC;1,PROG.OBJ;1,PROG.TSK;1/DE
```

This command line deletes the three individual files specified. (The /DE switch instructs PIP to delete the files.) Since the three files have the same file name and version number, but different types, the following command line would delete the same files:

```
PIP>PROG.*;1/DE
```

This command line also deletes any other files (on the default device in the default UFD) named PROG with a version number of 1. You should check existing files before using wildcards (for example, by issuing the command line PIP>PROG.*;1/LI).

2.2.3 File Specification Defaults

You can omit any field in a command-line file specification except the file name.[1] When you omit one or more fields in a file specification, the system assumes the following defaults:

Field	Default
ddnn:	The pseudo device unit SY:.[2]
[g,m]	The default UIC (see Section 2.2.1) specified for each terminal in one of the following ways: 1. At system generation (see the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide) 2. By means of the SET command (see Chapter 3) 3. By means of the HELLO command (see Chapter 3)
filename	No default (except for the BOOT command). A specification must include an explicit file name or a wildcard within the file-name field (see Section 2.2.2).
type	Any 1- through 3-character alphanumeric mnemonic, one of the types listed in Section 2.2.4, or null. Default types depend on the task to which the specification is directed and whether the specification refers to an input or an output file. For example, the FORTRAN compiler defaults the type of an input file to .FTN and the type of an output file to .OBJ.
version	For input files, the highest existing version number. For output files, the highest existing version number plus 1.
/switch	Switch defaults are established by individual tasks and commands.

2.2.4 Conventional and Default File Types

RSX-11M/M-PLUS has a set of conventional and default file types used to reflect the contents of a file. (The defaults used by DIGITAL-supplied software are described in the manuals that pertain to

---

1. The BOOT command is the only exception to this rule. See Chapter 3.

2. The BOOT command and specification of a dollar sign ($) in the INSTALL and RUN command lines default to device LB:. See Chapter 3.

the individual programs.) Although you can assign your own 3-character file types, it is convenient to use the following types:

Type	File Contents
BAS	BASIC-11 language source program (default)
BAT	Batch file (default)
B2S	BASIC-PLUS-2 source program (default)
CBL	COBOL language source program (default)
CLB	Indirect command file library (default)
CMD	MCR or task commands (an indirect command file; default)
COR	SLP correction file (convention; must be specified)
DAT	Data (as opposed to a program; convention; must be specified)
DIR	Directory (for example, a User File Directory; default)
FTN	FORTRAN IV, FORTRAN IV-PLUS, and FORTRAN-77 language source program (default)
LOG	Log of batch processing session (default)
LST	Listing file (default)
MAC	MACRO-11 source program (default)
MAP	Task Builder memory allocation map (default)
MLB	Macro library (default)
OBJ	Object program (output from the MACRO-11 assembler or a compiler; default)
ODL	Task Builder overlay description (default)
OLB	Object module library (default)
PAT	Correction file used by assembler to create a patched object module (convention; must be specified)
POB	Patched object module input file used by the PAT utility (convention; must be specified)
SML	System macro library (default)
STB	Symbol table (default)
SYS	Bootable system image (default)
TMP	Temporary file (convention; must be specified)
TSK	Task image (default)
TXT	Text file (convention; must be specified)
ULB	Universal library file (default)

2.2.5 Examples of File Specifications

In the following examples, the three letters followed by a right-angle bracket (>) are standard task prompts for the respective system programs.

- Assemble the MACRO-11 source file CRGPT.MAC and create the object output file CRGPT.OBJ. UFD [200,200] on device DM0: is specified for both files.

```
MAC>DM0:[200,200]CRGPT.OBJ=DM0:[200,200]CRGPT.MAC
```

- Delete the file SBG.OBJ;5. The output file specification is not applicable and therefore is omitted. The input device defaults to SY:.

```
PIP>[200,200]SBG.OBJ;5/DE
```

- Task-build the object file CRGPT.OBJ (.OBJ is the default file type for object files). The output file will be named CRGPT.TSK because .TSK is the default file type for the Task Builder's output file. The device and UFD are also defaulted.

```
TKB>CRGPT=CRGPT
```

- Delete all files with the name TESTDAT, regardless of type or version. The system uses default values for the device and UFD.

```
PIP>TESTDAT.*;*/DE
```

2.3 DEVICES

A primary function of the operating system is to manage all connected peripheral devices and thus maintain efficient system performance. Peripheral devices are the actual hardware elements that make up the computer system. During system generation, the system manager explicitly describes all peripheral devices attached to the system. Devices within multiuser protection systems are subject to a special set of MCR functions (described in Section 2.3.5).

Each device has a unique identifier. The identifier consists of two alphabetic characters, which form a logical device name (see Section 2.3.4), and an optional 1-, 2-, or 3-digit octal unit number, followed by a colon (:). If you omit the optional octal unit number, the system defaults to unit 0.

See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for a list of the peripheral devices supported by the respective operating system.

2.3.1 Logical Unit Numbers

A task performs I/O operations using logical units identified by numbers, called logical unit numbers (LUNs), rather than using specific device units. You assign a LUN to a specific device before the task actively uses the LUN. You can make the LUN assignment at one of three points:

1. At task-build time
2. From within the task at run time using the ALUN$ Executive directive
3. With the REASSIGN command after the task has been installed and while it is dormant

Refer to the RSX-11M/M-PLUS I/O Drivers Reference Manual or the appropriate language user's guide for more information about logical unit numbers.

2.3.2 Pseudo Devices

A pseudo device is a device-unit name that usually corresponds to a real physical device. This association is declared through the commands ASSIGN and REDIRECT. Pseudo devices provide a shorthand method for referencing the physical devices (for example, the pseudo device name SY: refers to the user's system device). Table 2-1 lists some of the RSX-11M/M-PLUS pseudo devices.

Table 2-1
Pseudo Devices

Pseudo Device	Name
Console listing device	CL:
Console output device	CO:
System library device	LB:
Terminal input/output device	TI:
User's system device	SY:
Spooling device (RSX-11M-PLUS only)	SP:

In a given task, LUN 1 may be assigned to CL:, the console listing device. When the task references LUN 1, the data is sent to whatever device CL: has been redirected to. You can redirect CL: to any appropriate device (a line printer or a terminal, for example) without affecting the task's execution.

A pseudo device redirected to a terminal assumes the privilege status of the terminal to which it is redirected. If the terminal is privileged, CL: becomes privileged when it is redirected to that terminal. But if CL: is subsequently redirected to a nonprivileged terminal, it will also become nonprivileged.

The normal procedure is to redirect the console output device (CO:) to the main operator's terminal and CL: to the line printer. The system automatically redirects TI:, the most commonly used pseudo device, depending on how a task has been activated:

- When you issue the RUN command to activate a task immediately, the system redirects the TI: for that task to your terminal.
- If, in a task, the Executive directives RQST$ or SPWN$ activate another task, that task's TI: defaults to the TI: of the task that issued the directive. A privileged task can specify an alternate TI: for the activated task.
- If the Executive enters a task into the clock queue for activation after a specified interval, the task's TI: defaults to CO:. (Both the RUN command and the Executive directive RUN$ allow a task to be activated at a specified interval from the time the command or directive was issued.)

2.3.3 The Null Device

Program testing often requires an available input or output device. The null device (NL:) can be used for either of these purposes. NL: is neither a pseudo nor physical device, but, most of the time, it is considered to be a pseudo device.

When a task reads from NL:, NL: returns the code for end-of-file (IE.EOF). When a task writes to NL:, NL: returns the code for success (IS.SUC) but discards the output.

As an example, if you are testing a program that normally generates large amounts of printout, you can assign the appropriate LUN to NL: rather than wasting paper or disk space.

2.3.4 Logical Device Names

Logical device names provide another means by which tasks can maintain device independence. (On RSX-11M, the availability of logical device names is a system generation option. On RSX-11M-PLUS, it is always included in the system.) A logical device name has the same syntax as a physical device unit. It consists of a 2-letter ASCII name and an optional 1- or 2-digit octal unit number, followed by a colon (:). The name can either be equivalent to a standard RSX-11M/M-PLUS device name (for example, DM:), or it can consist of two letters picked at random (for example, ZZ:). Before you run a task that refers to a logical device rather than a physical device, you must issue the ASSIGN command to associate the logical device name the task uses with a physical device unit (see Chapter 3).

NOTE

The names II: and RD: are used by DIGITAL software. Using these names as logical device names could produce undesirable results.

Three types of logical device assignments exist in RSX-11M/M-PLUS systems: global, local, and login.

- Global assignments apply to all tasks running in the system.
- Local assignments apply only to tasks initiated from the terminal used to make the assignments. Any terminal can define or delete its own set of local assignments.
- Login assignments apply only to systems that support multiuser protection. When a user issues the HELLO (or LOGIN) command to log in on the system, the system automatically establishes one or more login logical device assignments. The login assignments apply only to tasks initiated from the terminal while the current user is logged in. Only privileged users can define or delete login assignments.

The system uses local assignments before it uses login and global assignments, and login assignments before global assignments. If you make a local assignment using a logical device name that is already used in a login assignment, the system uses the local assignment. When you delete the local assignment, the system goes back to using the login assignment.

The Executive sets up a logical device table that records all logical device assignments and notes whether each assignment is local, login, or global. The Executive then searches this table every time a task refers to a device. A logical name found in the table receives precedence over a physical device unit having the same identifier.

2.3.5 Public, Private, and Unowned Devices

Systems that support multiuser protection impose special characteristics on devices. Devices can be public, private, or unowned. These characteristics are defined as follows:

- A public device is a device that anyone logged into the system can use. A privileged user can make a device public by issuing the SET /PUB command. If a privileged user mounts a volume on a public device, all system users can access files on the volume without having to mount the volume themselves (depending on the volume and file protection specified for the volume). A public device cannot be allocated and can only be dismounted by a privileged user with the DISMOUNT /DEV command. (See Chapter 3 for descriptions of the MOUNT, DISMOUNT, and SET commands.)
- A private device is a device that a user has allocated by means of the ALLOCATE command. Only privileged users and the owner of a private device can access the device for use within the Files-11 file system. If a nonprivileged user allocates a device and mounts a volume on the device, other nonprivileged users cannot access the volume; privileged users can access the volume by issuing a MOUNT command.
- An unowned device is a device that is neither public nor private. If a user, either privileged or nonprivileged, mounts a volume on an unowned device, all other users can issue subsequent MOUNT commands and thus access the volume.

  Nonprivileged users can allocate and mount a volume on an unowned device. Privileged users can also set public an unowned device.

A privileged user can designate any device in the system as a public device. The devices most commonly made public are the system disk (by default) and the system library device.

The ALLOCATE command (see Chapter 3) makes an unowned device private to the user issuing the command. Allocating a device prevents any other nonprivileged user from accessing the device. (Privileged users can override a nonprivileged allocation.) When a user accesses a device without allocating it, other users can then access and/or allocate that device.

The DEALLOCATE command (see Chapter 3) changes a private device back to an unowned device, thereby allowing other users to gain access to it. Privileged users can deallocate any private device no matter who owns it. Nonprivileged users can deallocate only their own private devices. When a user logs out, the system automatically dismounts and deallocates any private devices belonging to that user. For efficient use of system resources, however, users should deallocate devices as soon as the devices are no longer needed.

RSX-11M grants specific tasks, such as BAD and INI, access to unmounted volumes.

RSX-11M-PLUS does not permit any type of access to unmounted volumes. To access a volume on a physical device in an RSX-11M-PLUS system, you must first issue the MOUNT command. If a volume is not formatted or is in a format other than Files-11, you must mount the volume as foreign with the /FOR keyword.

2.4 TERMINALS

The terminal is the primary channel of communication between the user and the computer system. Each terminal in a system has a number associated with it, which is displayed when you log in. You can also refer to any terminal that you use as TI:, and you can work from more than one terminal at the same time.

In RSX-11M/M-PLUS, several terminals can operate concurrently. Each terminal operates independently of others in the system so that each can run tasks at the same time. For example, the PIP utility and the MACRO-11 assembler can run concurrently from different terminals. (The same task can also run concurrently from different terminals, although each copy of the task running will have its own identifier. See Section 2.5.4 for more information.)

2.4.1 Input Prompts

When you use MCR, there are three prompts that indicate a terminal is waiting for input from you:

- The default prompt (>)
- The task prompt (tsk>)
- The MCR prompt (MCR>)

The default prompt (>) at the beginning of a new line indicates that the terminal is ready to accept unsolicited input. The term unsolicited implies that no specific task has requested input from the terminal. Whatever you type in response to the default prompt is directed to MCR. (An abnormal situation can occur, however, if a task either solicits input or attaches to the terminal without displaying a task prompt. A soliciting or attached task might receive input that you intended for MCR. See Section 2.4.4 for information on attached terminals.) When MCR receives unsolicited input, it identifies, analyzes, and responds appropriately to the input.

When MCR activates a task to service a command, the task normally prompts:

```
tsk>
```

The variable tsk is a 3-character task name. (All DIGITAL system tasks identify themselves by a 3-character prompt and user tasks should do the same.)

As long as a prompting task has attached to a terminal, the task receives all solicited input entered at the terminal until the task detaches (see Section 2.4.4). The terminal discards all unsolicited input. An unattached task, however, may not receive solicited input because another task could solicit input from the terminal before you can type a response to the prompt for the unattached task. The intervening task would then receive the input intended for the unattached task. To avoid this situation, every task that solicits input from a terminal should perform the following sequence of actions:

1. Attach to the terminal.
2. Prompt with a properly formatted identifier (that is, tsk>).
3. Solicit input (issue a read request).

The MCR prompt (MCR>) is described in Section 1.1.1.

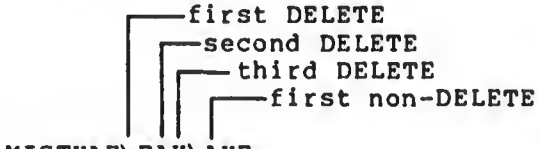
2.4.2 Special Character Keys and Control Characters

You can request the system to control terminal operation by means of special character keys and control characters. The relevant special character keys are TAB, ESCape (or ALTmode), RETURN, and DELETE (or RUBOUT). In this manual, the symbols , , , and , respectively, denote these keys. A control character is produced when you type a letter key while pressing the CTRL (control) key. In this manual, a control character is written CTRL/n where n is the variable letter key.

When you type CTRL/R, CTRL/U, or CTRL/Z, the Executive and the terminal driver display ^R, ^U, or ^Z at the issuing terminal and perform the related function. When you type CTRL/C, the explicit MCR prompt (MCR>) is displayed. (If the terminal is set to recognize commands from DCL or a user-written CLI, CTRL/C would display that prompt instead.) For the other control characters, the Executive does not return a display.

Table 2-2 lists all the special character keys and control characters, and describes the function of each.

Table 2-2
Special Character Keys and Control Characters

Character	Description
RETURN	The RETURN key terminates a line of input and advances the cursor or print head to the beginning of the next line.
ESC	The ESC key terminates a line of input without moving the cursor or print head. When used to terminate an MCR command, it suppresses the default MCR prompt. See the descriptions of the OPEN and RUN commands (in Chapter 3), which have special uses for the ESC key. In systems that selected the appropriate optional facility at system generation, the ESC key can be the first character in an escape sequence (see the RSX-11M/M-PLUS I/O Drivers Reference Manual and the description of the SET /ESCSEQ command in Chapter 3 of this manual).
DELETE	The DELETE key deletes the last character typed at the terminal and further contiguous characters if the key is pressed repeatedly. On non-CRT terminals, the first DELETE typed deletes a character and prints a backslash (\) followed by a display of the deleted character. Subsequent deletions cause the system to display the deleted characters. Then, when you enter the first non-DELETE character, the system prints a terminating backslash followed by the character typed. For example:  MISTKAE\EAK\AKE The result is MISTAKE. On a CRT terminal that supports backspacing (a system generation option in RSX-11M; always included in RSX-11M-PLUS) and has been declared to be a CRT terminal by the SET /CRT=ttnn: command, the DELETE key moves the printing position one space to the left and erases any character displayed in that position. For example, to correct the word MISTKAE, press the DELETE key three times to erase E, A and K respectively. The result is MIST. Then type AKE to get MISTAKE. (Note that when DELETE deletes a character in the last character position on the right of the screen, the last character appears to remain and the next-to-last character disappears. However, the system has in fact deleted the last character. You can type CTRL/R to verify this.)

(continued on next page)

Table 2-2 (Cont.)
Special Character Keys and Control Characters

Character	Description
CTRL/C	CTRL/C typed either as the first character in the line or when the terminal is sending data causes MCR to prompt for command input with the explicit prompt MCR>. If the terminal is set to a CLI other than MCR, typing CTRL/C displays the explicit prompt for the CLI. (Two special effects of CTRL/C are described in the following text.) If a task is prompting for input when you type CTRL/C, MCR displays its explicit prompt, then returns control to the interrupted task after receiving a single line of input. (An exception arises when an attached task specifies an Asynchronous System Trap -- AST -- for unrequested characters. In this case, CTRL/C causes an AST to occur, thereby gaining the task's attention rather than MCR's.) Special effects: • If the last character entered at the terminal was CTRL/S, CTRL/C resumes output suspended by the CTRL/S. • If a terminal has been set to "hold screen" mode by the SET /HOLD command, CTRL/C has the effect of a SET /NOHOLD command; that is, CTRL/C disables hold screen mode. (The hold screen feature is, in some cases, a system generation option in RSX-11M but is always included in RSX-11M-PLUS.) See Section 1.1.1 for more information on using CTRL/C.
CTRL/I or TAB	CTRL/I (or TAB) moves the cursor or print head to the next horizontal tab stop on the line. The system establishes tab stops at every eighth character position in the line (8, 16, 24, and so on).
CTRL/K	CTRL/K causes a vertical tab by performing four line feeds.
CTRL/L	CTRL/L causes a form feed (but does not perform paging). The action appears on the terminal as eight line feeds.
CTRL/O	CTRL/O alternately suppresses and resumes the display of output at your terminal. It allows you to skip over any unwanted output and then continue the display at a later point.

(continued on next page)

Table 2-2 (Cont.)
Special Character Keys and Control Characters

Character	Description
CTRL/O (Cont.)	When you type the first CTRL/O, the system discards the output it is sending to your terminal rather than displaying it. (The system can send the output much faster when it does not also have to display it.) When you type the second CTRL/O, the system begins displaying the output at the point it has reached in sending it (not from where you typed the first CTRL/O). If you do not type another CTRL/O, the system continues to display the output until it reaches the end. The effect of CTRL/O also depends on the state of the terminal when you type the character. If the terminal is attached to a task other than MCR, CTRL/O suppresses the display of the task's output until you type another CTRL/O to resume the display (as described previously). However, if the terminal is not attached to another task, CTRL/O suppresses only the remainder of the line currently being displayed. Subsequent lines of output will still be displayed.
CTRL/Q	CTRL/Q typed after a CTRL/S resumes output suspended by the previous CTRL/S.. (This feature is a system generation option in RSX-11M but is always included in RSX-11M-PLUS.)
CTRL/R	Typing CTRL/R before typing a line terminator (RETURN or ESC) causes the system to retype the current line on a new line, omitting any deleted characters. You can then continue typing the remainder of the line. For example: MISTKAE\EAK\AKE ^R MISTAKE If the current line is empty and you issue CTRL/R from the explicit MCR prompt (MCR>), CTRL/R performs a carriage return and line feed. CTRL/R is echoed as ^R. (This feature is a system generation option in RSX-11M but is always included in RSX-11M-PLUS.)
CTRL/S	Typing CTRL/S while the terminal is receiving output suspends additional output until you type CTRL/Q or CTRL/C. The suspended output is merely delayed, not discarded as with CTRL/O. The combined functions of CTRL/Q and CTRL/S are convenient when using a CRT terminal. (This feature is a system generation option in RSX-11M but is always included in RSX-11M-PLUS.)
CTRL/U	Typing CTRL/U before typing a line terminator (RETURN or ESC) deletes the current line. The system responds with a carriage return and line feed and displays a new prompt so that the line can be retyped.

(continued on next page)

Table 2-2 (Cont.)
Special Character Keys and Control Characters

Character	Description
CTRL/U (Cont.)	The system also displays a CTRL/U when you begin to type a command line but do not press the RETURN key before the timeout count expires. (The timeout count is specified at system-generation time.) Again, a new prompt is displayed. CTRL/U is echoed as ^U. (This control character works only with the full-duplex terminal driver.)
CTRL/X	Typing CTRL/X clears the terminal typeahead buffer. The typeahead buffer temporarily stores input characters until the terminal driver can pass them to the task. When the typeahead buffer is full, input characters are not accepted. Typing CTRL/X clears the buffer. (This control character works only with the full-duplex terminal driver.)
CTRL/Z	Typing CTRL/Z indicates end-of-file. It is used to indicate to system tasks such as MAC, PIP, and TKB that you are finished and the task may exit. CTRL/Z is echoed as ^Z.

2.4.3 Terminal Privilege

You can issue privileged commands only from a privileged terminal. On multiuser protection systems, individual users are either privileged or nonprivileged. When you log in, the terminal assumes your privilege status. On other systems, a terminal's privilege status is determined initially at system generation. You can also use the SET /[NO]PRIV command (see Chapter 3) at a privileged terminal to modify the privilege status of your own and any other terminal connected to the system.

CAUTION

You must take great care when any terminal is privileged. Privileged commands can destructively interfere with system operation.

2.4.4 Attached and Unattached Terminals

A terminal is attached when all input and output are directed to or from a task other than MCR. For example, when you invoke a task (such as the text editor EDI), the task usually attaches to the terminal so that no other task can use the terminal for I/O. When you wish to exit (by typing CTRL/Z, for example), the task is detached from the terminal and subsequent input is usually directed to MCR.

Since an attached terminal directs all input to the dedicated task, you must either exit from the task or type CTRL/C to gain MCR's attention before attempting to communicate with MCR. (See Section 1.1.1 for a description of CTRL/C as a means of temporarily gaining MCR's attention.)

See the RSX-11M/M-PLUS I/O Drivers Reference Manual for more information on terminals and terminal drivers.

2.4.5 Slaved Terminals

You can dedicate a terminal exclusively to one or more tasks by issuing a SET command option that sets the terminal to slave status. (A special I/O function issued by a task can also set a terminal to slave status.) The difference between a slave terminal and an attached terminal is that a slave terminal rejects all unsolicited input, including CTRL/C, but excepting CTRL/O, CTRL/Q, and CTRL/S. Attached terminals, as described in the preceding section, do accept CTRL/C.

Until you issue another MCR command (or a task issues another special I/O function) to delete the slave status, the terminal can only be used to communicate with tasks soliciting input from the terminal. Slaved terminals are often dedicated to real-time applications.

See the RSX-11M/M-PLUS I/O Drivers Manual for more information on terminals and terminal drivers.

2.5 TASKS

The basic executable unit of an RSX-11M/M-PLUS system is the task. A task is either privileged or nonprivileged. A privileged task has special device and memory access rights that a nonprivileged task does not have. Because of their special access rights, privileged tasks are potentially hazardous to a running system whereas nonprivileged tasks are not.

The following sections give only cursory information about tasks. Consult the RSX-11M/M-PLUS Task Builder Manual for a complete description.

2.5.1 Partitions

A task runs in a predetermined contiguous area of memory called a partition. A partition has the following characteristics:

- A name
- A defined size
- A fixed starting address
- A defined type

The relationship between a task and the partition in which it runs depends on whether the system is mapped or unmapped. RSX-11M-PLUS systems are always mapped. In an unmapped RSX-11M system, a task can run only in a partition that has the same starting address as the partition for which the task image was created by the Task Builder. In mapped systems, however, a task can run in any partition that is large enough to contain it.

2.5.1.1 Partition Types - There are two types of partitions in which tasks can execute:

- System-controlled
- User-controlled

RSX-11M supports both types of partitions.

RSX-11M-PLUS supports only system-controlled partitions.

In a system-controlled partition, the Executive allocates available space to accommodate as many tasks as possible at any one time. This allocation may involve shuffling resident tasks to arrange available space into a contiguous block large enough to contain a requested task. Only mapped systems support system-controlled partitions.

A user-controlled partition, however, is exclusively allocated to one task at a time. This type of partition is supported by both mapped and unmapped RSX-11M systems.

In both types of partitions, the Executive can temporarily move (checkpoint) a resident task to a disk to make space available for another task.

2.5.1.2 Subpartitions - RSX-11M users can subdivide a user-controlled partition into as many as seven nonoverlapping subpartitions. Like its parent main partition, a subpartition can contain only one task at one time. Since the subpartitions occupy the same physical memory as the main partition, tasks cannot be simultaneously resident in both the main partition and one or more subpartitions. But since each subpartition can contain a task, up to seven tasks can potentially run in parallel within a checkpointed main partition.

RSX-11M uses subpartitions to reclaim large storage areas in unmapped systems. For example, when a large task that requires a main partition is either no longer active or can be checkpointed, subpartitioning allows the partition space to be used for a number of smaller tasks.

2.5.2 Multiprogramming

Tasks compete for system resources (including memory) on the basis of priority and resource availability. The priority of a task is determined by a number assigned when the task is created by the Task Builder, when it is installed, or when it is run. The number is in the range 1 through 250(10), where 250 is the highest priority. The highest priority task that has access to and can use all the resources it needs has control of the CPU.

A task often becomes blocked when it requests system services. For example, it can block itself as it waits for an I/O transfer to complete. While the task is blocked in this way, the Executive looks for another task to use the CPU. The chosen task will be the one that has the highest priority and whose needed resources are available.

2.5.3 Creating a Task

You perform four steps to create a task and prepare it for execution:

1. Enter a program in a supported source language through an editor.

2. Submit the source code to the appropriate translator (assembler/compiler) to produce an object file.

3. Submit the object file to the Task Builder to produce a task image file.

4. Use the INSTALL command to install the task image file in the system or use the install-run-remove option of the RUN command (see Section 2.5.5.1).

The output files that result from Steps 1, 2, and 3 are each stored on a Files-11 volume.

2.5.4 Task-Naming Convention

On RSX-11M multiuser protection systems, more than one copy of an installed task whose name is in the form ...xxx can be active simultaneously (however, there can only be one copy active from one terminal). When you request a task that is already active, MCR automatically creates a name for a copy of the requested task: tskTnn, where tsk is the 3-character task name and Tnn is the octal unit number of the requesting terminal. However, to refer to that task from the requesting terminal, you only need to specify the 3-character task name (tsk).

For example, if you request PIP from TT2: when PIP is already active at another terminal, MCR runs a task called PIPT2. To abort PIPT2 from TT2:, enter the command:

```
>ABO PIP
```

MCR aborts the correct copy of PIP. However, to abort TT2:'s copy of PIP from another terminal, a privileged user must type:

```
>ABO PIPT2
```

The user at TT2: can also specify PIPT2, but the full name is not necessary in most cases.

On RSX-11M systems, unit numbers for terminals range from 0 through 77(8), although it is possible to have terminals connected to the system that have terminal numbers greater than 77. However, because of the xxxTnn naming convention for RSX-11M, if you try to run an active installed task from a terminal whose unit number is greater than 77, the task will have an incorrect name or you will get an error message.

Note that the naming convention does not apply to tasks requested by the RUN command.

On RSX-11M-PLUS systems, unit numbers for terminals range from 0 through 377(8). When you request a task, MCR creates a copy of the requested task and names it taskTnn. The letters tsk represent the 3-character task name and Tnn represents the octal unit number of the requesting terminal. (If the requesting terminal is a virtual terminal, the task name is taskVnn. If the request is from a serial bus device, the name is taskSnn.) For units 0 through 77(8), nn corresponds to the octal unit number. For units 100 through 377(8), the system defines nn using the following algorithm:

```
for   unit   100:   nn   is   A0
for   unit   101:   nn   is   A1
for   unit   107:   nn   is   A7
for   unit   110:   nn   is   B0
for   unit   117:   nn   is   B7
for   unit   120:   nn   is   C0
for   unit   127:   nn   is   C7
for   unit   130:   nn   is   D0
   .
   .
   .
for   unit   370:   nn   is   X0
for   unit   377:   nn   is   X7
```

To refer to the task from the requesting terminal, you only need to specify the 3-character task name (tsk).

For example, if you request PIP from TT100:, MCR runs a task called PIPTA0. To abort PIPTA0 from TT100:, enter the command:

```
>ABO PIP
```

MCR aborts the correct copy of PIP. However, to abort TT100:'s copy of PIP from another terminal, a privileged user must either specify the full task name (taskTnn) or use the ABORT command's /TERM keyword. For example, either of the following command lines issued from a privileged terminal abort TT100:'s copy of PIP:

```
>ABO PIPTA0

     or

>ABO PIP/TERM=TT100:
```

Note that the naming convention does not apply to tasks requested by the RUN command.

2.5.5 Installing a Task

When you install a task with the INSTALL command or a form of the RUN command, the system records a number of task parameters in a system-resident list called the System Task Directory (STD). These parameters include the name of the task and the address on the volume that contains the task image. An installed task is defined as a task that has an entry in the STD; it need not be resident in memory nor competing for system resources. The system considers a task dormant (not active) until a request is made for it to run.

The concept of dormant and active tasks is important in a real-time system. A dormant task does not use any memory outside of the Executive (it requires only an STD entry and need not be resident), yet when the task is needed to service a real-time event, the Executive quickly and efficiently introduces it into active competition for system resources. An installed task's STD entry enables this quick response because the STD contains all the parameters the system needs to retrieve the requested task.

You can run an installed dormant task by issuing the RUN command, or another task can request the task to run by issuing an Executive directive, such as RQST$ (Request), RUN$ (Run), or SPWN$ (Spawn).

When the Executive receives a request to run a task, it performs a series of actions:

1. Places the task in active competition for system resources (including memory) with other resident tasks.

2. Allocates the necessary resources as they become free.

3. Brings the task into memory when there is space available in its partition. (The Executive can checkpoint a lower priority checkpointable task, if there is one, to make room for the requested task.)

If another task fully occupies the partition in which the new task is to be installed and no resident task can be checkpointed, the system places the task in a queue of other requested tasks, each waiting for space to become available in its partition. Note that the number of installed dormant tasks can, and usually will, far exceed the number of active tasks.

2.5.5.1 Install-Run-Remove Tasks - On RSX-11M systems, whenever you request a task to run with the install-run-remove option of the RUN command, MCR names the task TTnn, where nn is the unit number of the terminal that requested the task. You can refer to task TTnn in a command issued from that terminal and omit the task name altogether.

For example, if you issue the command >RUN $CALC from TT1:, MCR runs the task contained in a file called CALC.TSK listed in the system directory and names it TT1. To abort this task from TT1:, issue the ABORT command without specifying a parameter:

```
>ABO
```

The command

```
>ABO TT1
```

issued from TT1: or from any privileged terminal also aborts the task originally referred to as $CALC in the RUN command issued from terminal TT1:.

On RSX-11M-PLUS systems, MCR also names the task TTnn, where nn is the unit number of the terminal that requested the task. To refer to task TTnn in a command issued from that terminal, you can omit the task name altogether. For example, if you issue the following command from TT377:

```
>RUN $CALC
```

MCR runs the task contained in the file CALC.TSK listed in the system or nonprivileged library directory and names it TTX7. To abort this task from TT377:, issue the ABORT command without specifying a parameter:

```
>ABO
```

A privileged user can abort the task either by specifying the task name (TTnn) or by using the ABORT command's /TERM keyword. For example:

```
>ABO TTX7

     or

>ABO /TERM=TT377:
```

These commands issued from a privileged terminal abort the task originally referred to as $CALC in the RUN command issued from TT377:.

Note that the RSX-11M-PLUS system does not require you to perform conversions. Commands that include a task-name parameter (for example, the ABORT, RESUME, BLOCK, UNSTOP, and ALTER commands) accept a keyword that permits the octal representation of task names (/TERM:TTnn:). For example, if task XYZ is initiated from TT106: and suspends itself, a privileged user can issue the following command line to resume execution of task XYZTA6:

```
>RES XYZ/TERM=TT106:
```

2.6 NONPRIVILEGED USE OF ACNT

RSX-11M/M-PLUS systems provide an Account File Maintenance Program (ACNT) for creating and maintaining an account file for a multiuser protection system. The account file contains entries for all the UICs that have been authorized for use in the system. One UIC can be shared by several users, each user having his or her own password.

A nonprivileged user can run the ACNT program to change his or her password. All other ACNT options are privileged. The ACNT task must first be installed by a privileged user before a nonprivileged user can run it.

When you run the ACNT program, it identifies itself and immediately prompts for your current password. ACNT then searches the account file for the entry that matches the UIC and password. When ACNT locates the correct entry, it prompts you for the new password or an ESCape. If you enter a new password, ACNT changes your current password to the new one. If you press the ESCape key, ACNT leaves your current password unchanged. The prompt also shows the maximum character length allowed for a password.

If you do not enter your current password or enter it incorrectly, ACNT issues an error message and exits. You must run the ACNT program again to change your password.

After ACNT changes the password or you press the ESCape key, ACNT displays the message OPERATION COMPLETE and exits.

See the RSX-11M/M-PLUS System Management Guide for more information on ACNT and its privileged options.

Examples:

```
>RUN ACNT
  * ACCOUNT FILE MAINTENANCE PROGRAM *
Password ( <=6 chars. ):  ANGEL
Type <ESC> to leave entry unchanged
Password ( <=6 chars. ):  ESC
OPERATION COMPLETE


>RUN ACNT
  * ACCOUNT FILE MAINTENANCE PROGRAM *
Password ( <=6 chars. ):  ANGEL
Type <ESC> to leave entry unchanged
Password ( <=6 chars. ):  DEVIL
OPERATION COMPLETE


>RUN ACNT
  * ACCOUNT FILE MAINTENANCE PROGRAM *
Password ( <=6 chars. ):  ANGEL
Type <ESC> to leave entry unchanged
Password ( <=6 chars. ):  TOOLONG
ACNT -- Syntax or command input error
OPERATION COMPLETE


>RUN ACNT
  * ACCOUNT FILE MAINTENANCE PROGRAM *
Password ( <=6 chars. ):  JANGEL
ACNT -- Cannot find account
OPERATION COMPLETE
```

CHAPTER 3

MCR COMMANDS

This chapter describes all of the MCR commands. The commands are in alphabetical order regardless of function or privilege status.

The descriptions of the commands and messages given in this chapter observe the following notational conventions:

- Lowercase text indicates a variable whose actual value is determined when the command is entered or the message is issued. For example, the value of "taskname" depends on the name of the task associated with the command or message.

- Square brackets ([]) indicate optional entries in a command line or file specification. Note that when an option is entered, the brackets are not included.

  Square brackets are also a part of the User File Directory (UFD) and User Identification Code (UIC) syntax ([group, member]). When you use a UFD or UIC (in a file specification, for example), brackets are required syntax elements; that is, they do not indicate optional entries.

- Unless explicitly qualified, all numeric values required in a command can be entered as decimal or octal. Decimal values are indicated by a trailing period (.); octal values are indicated by the absence of the period or by a pound sign (#) preceding the number. Thus,

  ```
  255.
  ```

  and

  ```
  377
  ```

  and

  ```
  #377
  ```

  have the same value. (The value 255. is base 10; the value 377 is base 8.)

The following subheadings appear in the detailed command descriptions that follow. Subheadings that do not apply to a particular command are simply omitted from the command description.

COMMAND NAME

This heading identifies the command name in capital letters. The minimal MCR command abbreviation is shown on the upper right or left margin. The text following this subheading describes the command's function. A (NP) following the command name indicates that the command is nonprivileged. A (P) following the command name indicates that the command is privileged. A (NP,P) indicates a nonprivileged command with privileged options. A (P,NP) indicates a privileged command with nonprivileged options.

Format

This subheading is followed by the command format and a description of all parameters.

Command-Related Error Messages

Error messages specific to the command appear under this subheading. The command may also produce the common error messages listed in Appendix A. These common error messages are not listed with the individual commands.

ABO

ABORT (NP,P)

The ABORT command terminates execution of a specified task. Nonprivileged users can abort nonprivileged tasks requested from the issuing terminal on systems with multiuser protection or any nonprivileged task on systems without multiuser protection. Nonprivileged users can also abort privileged tasks requested from the issuing terminal if the tasks have requested an exit AST service routine with the SREX$ form of the SPECIFY REQUESTED EXIT AST Executive directive. Privileged users can abort any task.

When a task that has specified an exit AST service routine is aborted, it enters the routine instead of being aborted immediately. Privileged tasks enter the specified AST routine each time a valid abort request is issued. However, future exit ASTs are not queued until the first exit AST has been effected. Nonprivileged tasks enter the specified AST routine only once. After that, any valid attempt to abort the task succeeds.

See the RSX-11M/M-PLUS Executive Reference Manual for more information on the SPECIFY REQUESTED EXIT AST directive. Note that the issuing terminal receives no indication that the task being aborted was actually aborted or that it received the abort AST instead.

Aborting a task forces an orderly termination of the specified task. To effect the termination, the system:

- Performs I/O rundown. Cancels I/O for all non-file-structured devices. Allows I/O for file-structured devices to complete and then deaccesses the files. Detaches all attached devices. (I/O rundown may take a considerable amount of time for tasks connected to a network node.)

- Requests the Task Termination Notification program (TKTN) to display a message on the aborted task's issuing terminal giving the reason for the termination. (If the /PMD keyword is specified and the task is not checkpointed, the task's registers are also displayed.)

- Releases the task's partition if the task is not fixed.

- If the system supports the ALTER PRIORITY directive (a system generation option), alters the task's running priority to 247 (unless the exit AST service routine has been specified). A task must be memory-resident to be aborted; this change in running priority usually causes a quick return for a checkpointed task.

If the command includes the optional keyword /PMD, it forces the system to produce a postmortem dump of the aborted task. The dump is generated even if the task was not built with the Task Builder /PM switch or installed with the INSTALL /PMD=YES keyword.

Format:

```
ABO[RT] taskname[/PMD][/TERM=TTnn:]
```

ABO (Cont.)

taskname

The name of the task to be aborted. If you omit the taskname, the command attempts to abort task TTnn. (The variable nn is the octal unit number of the issuing terminal.)

Likewise, if you specify only the first three characters of the taskname, ABORT defaults the taskname to tskTnn.

/PMD

A keyword that requests a Postmortem Dump of the aborted task.

/TERM=TTnnn:

A privileged RSX-11M-PLUS keyword that aborts a task requested from a terminal other than the one issuing the ABORT command.

Examples:

```
>ABO MAC
Task "MACT3 " terminated
Aborted via directive or CLI
```

MCR (the command line interpreter for these examples) aborted a task called MACT3, even though the command, issued from TT3:, specified only the 3-letter task name.

On RSX-11M and RSX-11M-PLUS systems, the command >ABO MACT3, issued from any privileged terminal, would have the same effect.

On RSX-11M-PLUS systems, the command >ABO MAC /TERM=TT3:, issued from another (privileged) terminal, would have the same effect.

```
>ABO
Task "TT7   " terminated
Aborted via directive or CLI
```

MCR aborted the task, TT7, from TT7:; the task name does not have to be specified to abort task TTn.

Command Error Messages:

On receiving an ABORT command, MCR requests the Executive to abort the task. The Executive subsequently activates the Task Termination Notification program (TKTN). TKTN then produces the termination display shown in the examples. Messages following an ABORT command can therefore come either from the ABORT command itself or from TKTN.

Messages from ABORT command:

ABO -- TASK MARKED FOR ABORT

A previous request has already been made to abort the specified task, but the abort has not yet occurred. The task marked for abort is probably not currently resident in memory or it has outstanding I/O (for example, an MM: tape-positioning operation must complete).

ABO -- TASK NOT ACTIVE

The specified task is not currently active.

Messages from Task Termination Notification program (TKTN):

TKTN displays information about task aborts, whether caused by the ABORT command or by some other means. The display has the format:

```
TASK "taskname" TERMINATED
abort cause
```

Following the displayed cause for the abort is a list of the task's registers at the time of the abort (if the task was not checkpointed). The possible causes of an abort are described in the following messages:

ABORTED VIA DIRECTIVE OR CLI

Either an Executive directive or a CLI command issued by another task caused the task to be aborted.

ABORTED VIA CLI
POSTMORTEM DUMP WILL BE GENERATED

A CLI command aborted the task and requested a Postmortem Dump.

11/40 F.P. EXCEPTION

The task encountered a floating point exception while executing on a PDP-11/40 and no SST routine was specified to process the trap.

AST ABORT. BAD STACK

An AST could not be effected because the AST parameters could not be pushed onto the task's stack.

CHECKPOINT FAILURE. READ ERROR

The task could not be read back into memory after being checkpointed.

CPU TIME LIMIT EXCEEDED

(RSX-11M-PLUS systems only.) The task exceeded the CPU time limit specified with the /TIME keyword when the task was installed.

IOT EXECUTION

The task executed an IOT instruction and no SST routine was specified to process the trap.

LOAD FAILURE. READ ERROR

The task could not be loaded because of a hardware error.

ABO (Cont.)

MEMORY PROTECT VIOLATION

The task encountered a memory-protect violation and no SST routine was specified to process the trap.

NON-RSX EMT EXECUTION

The task executed an EMT instruction with an argument other than 377(8) or, in the case of a privileged task switching to system state, 376(8), and no SST routine was specified to process the trap.

ODD ADDRESS OR OTHER TRAP FOUR

The task executed a word instruction with an odd address or referenced a nonexistent memory location in an unmapped system, and no SST routine was specified to process the trap.

PARITY ERROR

A parity error occurred while the task was executing. The task was fixed in memory so that the memory could not be reused by another task.

REQUIRED BUS RUNS ARE OFFLINE OR NOT PRESENT

(RSX-11M-PLUS multiprocessor systems only.) The task, or a common that it is mapped to, was installed with an affinity for a CPU or a bus run that is off line.

RESERVED INST EXECUTION

The task executed an illegal instruction and no SST routine was specified to process the trap.

SST ABORT. BAD CSM PARAMETERS

(RSX-11M-PLUS systems only.) The task executed a CSM (Call to Supervisor Mode) instruction with invalid parameters.

SST ABORT. BAD STACK

An SST could not be effected because the SST parameters could not be pushed onto the task's stack, or a stack overflow was detected in an unmapped system, as indicated by a nonzero value in the header guard word.

TASK EXIT WITH OUTSTANDING I/O

The task exited with one or more outstanding I/O requests. Tasks should terminate all I/O operations before exiting. The system does, however, process all outstanding I/O.

TASK INSTALLED IN MORE THAN ONE SYSTEM

The task image file has been installed in more than one system. When a task is installed, pointers to various system data structures are stored in the task header in the task image file. If a task is installed in more than one system, the header contains pointers for the last system in which the task was installed. When the task is loaded for execution, the loader verifies that the header contains valid pointers for the current system. When a task has been installed in more than one system, the loader check fails and the task is aborted.

T-BIT TRAP OR BPT EXECUTION

The task either set the T-bit in the Processor Status Word or executed a Breakpoint Trap instruction, and no SST routine was specified to process the trap.

TI: VIRTUAL TERMINAL ELIMINATED

(RSX-11M-PLUS systems only.) The terminal from which the task was initiated (its TI:) was a virtual terminal that has since been eliminated. This happens to an offspring task when its parent task issues an ELIMINATE VIRTUAL TERMINAL directive and exits or aborts. The offspring task cannot continue running without a TI: and is aborted.

TRAP EXECUTION

The task executed a TRAP instruction and no SST routine was specified to process the trap.

ACS

ALLOCATE CHECKPOINT SPACE (P)

The ALLOCATE CHECKPOINT SPACE (ACS) command allocates or discontinues a checkpoint file on disk for systems that support the dynamic allocation of checkpoint space. The disk containing the checkpoint file must be in Files-11 format. Only one checkpoint file per disk is allowed, but numerous disks can each contain a checkpoint file. In general, sufficient checkpoint space is twice the total amount of memory that all of the running tasks will use.

When the system needs checkpoint space, it searches the checkpoint files in the order in which they were created. If space is not available in the first file created (the primary file), it searches for space in the second file created (the secondary file), and so on.

An ACS command that discontinues a checkpoint file may not take effect immediately. If the specified file contains one or more checkpointed tasks, the tasks must be returned to memory before the system can discontinue the file. However, once the request to discontinue the file has been made, the system does not use the file for any more checkpointed tasks.

Format:

ACS ddnn:/BLKS=n

ddnn:

A device unit that contains a mounted Files-11 disk. If the unit number (nn) is not specified, it defaults to 0.

/BLKS

/BLKS=n. A keyword that specifies the number (n) of blocks on the disk to be allocated for the checkpoint file. (A block is 512 decimal bytes.) For example, the command

```
>ACS DB:/BLKS=250.
```

allocates 250(10) blocks for a checkpoint file on DB:.

When n is 0, the system discontinues the use of the checkpoint file; the file is neither deleted nor truncated. However, the use of the file is discontinued only after all of the tasks that are checkpointed to it can be brought into memory and checkpointed elsewhere.

For example, the command

```
>ACS DB:/BLKS=0
```

discontinues the checkpoint file on disk DB0:. This does not mean that the space allocated to the checkpoint file is freed. The system checkpoint file [0,0]CORIMG.SYS retains the space initially allocated by the ACS command so that the space will be available the next time it is needed. If you want to free the

ACS (Cont.)

space allocated to the system checkpoint file after its use has been discontinued, use the following commands:

```
>ACS ddnn:/BLKS=0

ACS -- CHECKPOINT FILE NOW INACTIVE

>PIP [0,0]CORIMG.SYS/TR
```

You must set the block size of the checkpoint file to 0 to discontinue it before you can truncate it. Do not issue the PIP command line until the "Checkpoint file now inactive" message has been displayed. PIP cannot determine if the checkpoint file is still in use, so issuing the command line could cause volume corruption and/or a system crash.

Examples:

```
>ACS DS:/BLKS=250.
>ACS DB:/BLKS=1024.
```

Allocates a primary checkpoint file on DS: and a secondary checkpoint file on DB:. The primary file is 250(10) blocks long and the secondary file is 1024(10) blocks long. When the system searches for checkpoint space, it will first look in the file on DS: and then in the file on DB:.

```
>ACS DS:/BLKS=0
```

Discontinues use of the checkpoint file on DS:.

Command Error Messages:

ACS -- CHECKPOINT FILE ALREADY IN USE ON DEVICE

A previous ACS command established a checkpoint file on the volume mounted on the specified device unit. A volume can contain only one checkpoint file.

ACS -- CHECKPOINT FILE NOW INACTIVE

This message appears after you issue an ACS command to discontinue a checkpoint file and the file does not contain any checkpointed tasks. The message indicates that use of the file was discontinued immediately after the command was issued. If the file is still in use, TKTN will issue a message when the file is finally discontinued.

ACS -- DYNAMIC ALLOCATION OF CHECKPOINT SPACE NOT SUPPORTED

The ACS command was issued on an RSX-11M system that did not include support of dynamic allocation of checkpoint space at system generation. (All RSX-11M-PLUS systems include this feature.)

ACS (Cont.)

ACS -- FILE I/O ERROR nnn.

The ACS command detected an error when it tried to allocate or open the checkpoint file. The code nnn. is an FCS error code that defines the cause of the error. See the IAS/RSX-11 I/O Operations Reference Manual. (If the code is -24, the message may indicate that the disk, usually a fixed-head disk, does not have enough contiguous space to allocate the file. The normal implication of the code -24 is "device full".)

ACS -- FILE NOT IN USE

A checkpoint file was not in use on the device specified in the ACS command.

ACS -- NOT FILES-11 DEVICE

The command specified a device that did not contain a Files-11 disk. The specified device unit must contain a mounted Files-11 disk.

*** ddnn: -- CHECKPOINT FILE NOW INACTIVE

The message, issued by TKTN, indicates that a request to discontinue use of a checkpoint file on device ddnn: has finally been satisfied. The need to return checkpointed tasks from the discontinued file back into memory caused the delay between the request and this message.

*** tsknam CHECKPOINT SPACE ALLOCATION FAILURE

The task could not be checkpointed because there was not enough room in the system checkpoint file and checkpoint space was not allocated in the task image file. Either make the system checkpoint file bigger or create a second one.

Note that tasks built with the /AL switch are checkpointed to their task image file if the system checkpoint file is full.

ACT

ACTIVE (NP)

The ACTIVE command displays at the entering terminal the names of all active tasks that have that terminal as their TI:. On RSX-11M-PLUS systems, the display includes the octal unit number of the terminal that initiated each task.

When the ACTIVE command is issued with /ALL (ACT /ALL), the names of all active tasks in the system are displayed.

The ACTIVE command can also be issued with /TERM (ACT /TERM=TTnn:) to display the names of all the active tasks for a specific terminal.

Format:

```
ACT[IVE] [/keyword]
```

/keyword:

```
/ALL
/TERM=TTnn:
```

Examples:

RSX-11M systems

```
>ACT
MCR...
...MCR
>ACT /ALL
RMDEMO
MCR...
...MCR
F11ACP
...PIP
>ACT /TERM=TT7:
...PIP
>
```

RSX-11M-PLUS systems

```
>ACT
MCR...   (TT17:)
ACTT17   (TT17:)
>
>ACT /ALL
LDR...   (CO0:)
RMDEMO   (TT62:)
MCR...   (TT17:)
F11ACP   (CO0:)
DS00F1   (CO0:)
DS01F1   (CO0:)
LSTACP   (CO0:)
DB03F1   (CO0:)
AT.V6    (VT6:)
QMG...   (CO0:)
HRC...   (CO0:)
PIPTA1   (TT101:)
>
>ACT /TERM=TT107:
LBRTA7   (TT107:)
>
```

ALL

ALLOCATE (NP,P)

The ALLOCATE command establishes a specified device as your private device. (This command applies only to RSX-11M systems that support multiuser protection and all RSX-11M-PLUS systems.) Device allocation prevents other nonprivileged users from accessing a device (see Section 2.3.5). Only the device's owner or a privileged user can access or deallocate a private device.

Mounted devices, public devices, or other users' private devices cannot be allocated.

The system automatically deallocates your private devices when you log out (issue the BYE command).

You can also allocate a device to a specific terminal rather than to TI:. This allows you to allocate a device to a virtual terminal.

Format:

ALL[OCATE] dd[nn:] [=llnn:] [/keyword]

dd

The device mnemonic of the device-unit to be allocated.

nn:

The optional device-unit number. If the number is omitted, the system allocates the first available logical unit of the dd-type device and displays the allocated device in the following format:

ALL -- ddnn: NOW ALLOCATED

llnn:

The optional name of a logical device, which the system creates and assigns to the physical device being allocated. (This is a local assignment as created by the ASSIGN command.) Specifying a logical device name is helpful when using the /TYPE keyword in an indirect command file.

/keyword

One of the following:

/TERM=TTnn:

Specifies the terminal number (TTnn:) to which the device is to be allocated.

/TYPE=dev

Specifies the type of device wanted when doing a generic allocation. Instead of allocating a specific device, the command allocates the first available device of the specified type. dev is the physical name of the device (for example, RP06, RK07).

ALL (Cont.)

On RSX-11M, this keyword is valid for the following devices:

RA60	RK06	RP03	RM05
RA80/81	RK07	RP05	RM80
RC25	RL01	RP06	RS03
RCF25	RL02	RP07	RS04
RD51	RP02	RM03	RX50

Examples:

>ALL DK2:

Allocates disk DK2:.

>ALL DK:

Allocates disk DK0:.

>ALL DK1:/TERM=VT1:

Allocates disk DK1: to the specified virtual terminal, VT1:.

>ALL DK=XX0:
ALL -- DK3: NOW ALLOCATED

Allocates the first available logical unit of DK (in this case, disk DK3:, since units 0, 1, and 2 were allocated previously or are public devices) and assigns it the logical name XX0:.

>ALL DB/TYPE=RP06

Allocates any available RP06 disk.

Command Error Messages:

ALL -- DEVICE ALLOCATED TO OTHER USER

The specified device has already been allocated by another user.

---

1. The formatter name appears only if the drive is not a TU45/TU77/TU78/TE16.

ALL (Cont.)

ALL -- DEVICE ATTACHED

The specified device cannot be allocated because it is attached to a running task.

ALL -- DEVICE dd: NOT IN SYSTEM

The specified device driver does not exist in the system, or the data base for the device driver is not in the system or in the driver's task image.

ALL -- INVALID KEYWORD

The specified keyword cannot be used with the ALLOCATE command.

ALL -- PSEUDO DEVICE ERROR

The specified device is a pseudo device. Pseudo devices cannot be allocated.

ALL -- PUBLIC DEVICE

The command attempted to allocate a public device. Public devices cannot be allocated.

ALL -- USER LOGGED ON TERMINAL

The command attempted to allocate a terminal that has been logged-in by another user. Logged-in terminals cannot be allocated.

ALT

ALTER (P)

The ALTER command changes the static or running priority of an installed task.

Format:

ALT[ER] taskname /keyword(s)

taskname

The name of the task whose priority is to be altered.

/keyword(s)

One or more of the following:

/PRI=n

Changes the task's static priority, and, if the system supports the ALTER PRIORITY directive, the task's running priority. (All RSX-11M-PLUS systems support the directive.)

/RPRI=n

Changes the task's running priority only (valid only in systems that support the ALTER PRIORITY directive).

/TASK=tttnn:

A privileged RSX-11M-PLUS keyword that alters the priority of a task not initiated from the issuing terminal.

The priority is in the range 1 to 250(10). The system assumes that the priority you specify is octal unless you include a period (.).

Examples:

RSX-11M systems

```
>ALT TEST /PRI=60.
```

Alters the static and running priority of task TEST to 60(10).

```
>ALT CMFRUN /RPRI=70.
```

Alters the running priority of task CMFRUN to 70(10).

RSX-11M-PLUS systems

```
>ALT ABC/PRI=100./TERM=TT6:
```

Alters the static and running priority of task ABCT6 to 100(10).

ASN

ASSIGN (NP,P)

The ASSIGN command defines, deletes, or displays logical device assignments. Logical device assignments associate logical names with physical devices, pseudo devices, or other logical devices. When you assign a logical name to a pseudo or logical device, the system resolves the assignment to the associated physical device. There are three types of logical device assignment: global, local, and login.

- Global assignments apply to all tasks running in the system. Only privileged users can issue ASN commands to define or delete global assignments.

- Local assignments apply only to tasks initiated from the terminal used to make the assignments. Any terminal can define or delete its own set of local assignments.

- Login assignments occur only in RSX-11M systems that support multiuser protection and all RSX-11M-PLUS systems. When a user issues a HELLO command to log into the system, the system automatically assigns the logical name SY: to the user's system device, which is the device that contains the user's files. The login assignments apply only to tasks initiated from the terminal while the current user is logged in. Only privileged users can define or delete login assignments.

The system uses local assignments before it uses login and global assignments, and login assignments before global assignments. If you make a local assignment using a logical device name that is already used in a login assignment, the system uses the local assignment. When you delete the local assignment (using ASN=), the system goes back to using the login assignment.

A logical-device name has the same syntax as a real device unit; it consists of a 2-character ASCII name (alphabetic) and an optional 1- or 2-digit octal unit number, followed by a colon (:). The 2-character name can either be equivalent to a standard RSX-11M/M-PLUS device name (for example, DK:) or it can be two letters picked at random (for example, ZZ:).

When you install a task or the system processes an ASSIGN LUN directive, the system scans the logical device table before the physical device table when searching for a specified device. As a result, a user can define logical device names that are identical to physical device names even though the logical and physical device names do not refer to the same physical device. The system resolves a specified device name to the first matching table entry found. Therefore, if a logical device name is identical to a physical device name, the logical name has precedence.

The following legend explains the terms used in the descriptions of the various ASN formats for nonprivileged and privileged users.

ASN (Cont.)

pp

The physical, logical, or pseudo device name.

nn

The unit number.

ll

The logical device name.

tt

The terminal device name.

Nonprivileged formats:

ASN ppnn:=llnn:

Assigns the logical name llnn: to device ppnn:. The command establishes a local assignment for the issuing terminal.

ASN

Displays all local and login logical-device assignments for the issuing terminal.

ASN =[llnn:]

Deletes the local assignment of the specified logical-device name; or deletes all local logical-device assignments for the issuing terminal if the command omits llnn:.

Privileged formats:

ASN ppnn:=llnn:/GBL

Defines a global assignment that associates the logical name llnn: with device ppnn:.

ASN /GBL

Displays all global, local, and login assignments for all terminals in the system.

ASN =[llnn:]/GBL

Deletes the specified global logical-device assignment; or deletes all global assignments if the command omits llnn:.

ASN ppnn:=llnn:/LOGIN[/TERM=ttnn:]

Establishes a login logical-device assignment for a specified terminal or for the issuing terminal if the command omits /TERM=ttnn:.

ASN /TERM=ttnn:

Displays all local and login logical-device assignments for the specified terminal.

ASN (Cont.)

ASN =llnn:/LOGIN[/TERM=ttnn:]

Deletes the login logical-device assignment indicated by the name llnn: for a specified terminal or for the issuing terminal if the command omits /TERM=ttnn:.

ASN =/LOGIN[/TERM=ttnn:]

Deletes all login logical-device assignments for the specified terminal or for the issuing terminal if the command omits /TERM=ttnn:.

ASN =[llnn:]/TERM=ttnn:

Deletes the local logical-device assignment indicated by the name llnn: for the specified terminal; or deletes all local logical-device assignments for the specified terminal if the command omits llnn:.

Example:

```
>ASN   DP:=SY:                !Define SY:
>ASN   DP:=US1:               !Define US1:
>ASN   DT:=US2:               !Define US2:
>ASN   DK:=GB0:/GBL           !Define global logical device name GB0:
>ASN                          !List local and login assignments
US2:   DT0:   LOCAL TI - TT0:
US1:   DP0:   LOCAL TI - TT0:
SY:    DP0:   LOGIN TI - TT0:
>ASN   /GBL                   !List all assignments
US2:   DT0:   LOCAL TI - TT0:
US1:   DP0:   LOCAL TI - TT0:
SY:    DP0:   LOGIN TI - TT0:
GB0:   DK0:   GLOBAL
>ASN   =US2:                  !Eliminate local logical device name
US2:
>ASN   =/GBL                  !Eliminate all global assignments
>ASN   =US1:                  !Eliminate local logical device name
                                  US1:
>ASN   DK:=XY:                !Assign XY: to DK:
>ASN   XY:=ZZ:                !Assign ZZ: to XY:
>ASN                          !Display assignments
ZZ0:   DK0:   LOCAL TI-TT0:
XY0:   DK0:   LOCAL TI-TT0:
```

Command Error Messages:

ASN -- DEVICE NOT TERMINAL

The /TERM keyword used in the ASN command did not specify a terminal.

ASN -- LOGICAL DEVICE NOT IN SYSTEM

The specified logical device name was not included in the system at system generation and therefore could not be found in the logical device assignment table for the terminal.

ATL

ACTIVE TASK LIST (MP)

The ACTIVE TASK LIST (ATL) command displays the name and status of all active tasks in the system or the status of a particular task. The display provides information useful for determining the exact status of each active task. The display contains the following information for each task:

- Task name
- Task control block physical address (octal)
- Partition name
- Partition control block physical address (octal)
- Partition base and limit physical addresses (octal)
- Task's running priority and default priority
- Task status flags
- TI: terminal physical device-unit
- Nonbuffered and buffered I/O counts (decimal)
- Task local event flags
- Task registers and Processor Status Word (memory-resident tasks only)
- RSX-11M-PLUS also displays the name of the parent task (if one exists) as well as the task blocking count.

On RSX-11M-PLUS, the display lists the tasks installed in primary pool and then those installed in secondary pool. The tasks in secondary pool are indicated by a plus sign (+).

The displayed task status flags are from the Task Control Block (TCB) or the Partition Control Block (PCB). The ATL command displays the name of the bit if the bit is set to 1 at the time of the display. Bits set to 0 are not displayed. Flag names are three characters long and correspond to the last three characters of the mnemonic defining the status bits. For example, AST represents the bit T2.AST and indicates that the task is processing an Asynchronous System Trap. Names prefixed by a minus sign (-) indicate that the bit represents the complement of the condition. For example, -CHK indicates that the task is not checkpointable.

If the task is not in memory (the OUT flag is displayed), the contents of the PC (program counter), the PSW (Processor Status Word), and the registers are not displayed.

ATL (Cont.)

The following list gives the flag names and a brief explanation of each one.

Status	Description
ABO	Task is being aborted.
ACP	Task is an Ancillary Control Processor (ACP).
AST	Task is processing an AST.
BLK	Task is blocked by a CLI command.
CAF	Task cannot be checkpointed due to checkpoint space allocation failure.
CAL	Checkpoint space is allocated in task image.
-CHK	Task is not checkpointable.
CIP	Task is blocked for checkpoint in progress (RSX-11M-PLUS).
CKD	Task has checkpointing disabled (RSX-11M).
CKP	Task is checkpointed (RSX-11M) or blocked for checkpoint in progress (RSX-11M-PLUS).
CKR	Task checkpoint request pending.
CLI	Task is a CLI task.
CMD	Task is executing a CLI command (RSX-11M-PLUS).
DSP	Task was built with separate I- and D-space (RSX-11M-PLUS).
DST	Task ASTs are disabled.
-EXE	Task is not in execution.
FXD	Task is fixed in memory (RSX-11M) or partition is fixed in memory (RSX-11M-PLUS).
GFL	Task has its group global event flags locked.
HLD	Task is half-loaded (RSX-11M).
HLT	Task is being halted.
LDD	Task's load device has been dismounted (RSX-11M-PLUS).
MCR	Task was activated by MCR.
MPC	Task has mapping change and outstanding I/O (RSX-11M-PLUS).
MSG	Task aborted, waiting for TKTN message.
MUT	Task is a multiuser task (RSX-11M-PLUS).
NET	Network protocol.
NRP	Task is mapped to nonresident partition (RSX-11M).
NSD	Task cannot receive data (no send data allowed).
-PMD	Suppress Postmortem Dump on SST abort.
OUT	Task is out of memory (RSX-11M) or partition is out of memory (RSX-11M-PLUS).
PRO	Task has prototype TCB (RSX-11M-PLUS).
PRV	Task is privileged.
PRVD	Task was privileged but has been set nonprivileged (RSX-11M-PLUS).
RDN	Task I/O is being run down.
REM	Task is to be removed on exit.
REX	Task has abort AST effected or in progress.
ROV	Task has resident overlays.
RST	Task is restricted (used by layered software).
RUN	Task is executing on another processor (RSX-11M-PLUS multiprocessing systems only).
SEF	Task is stopped for an event flag(s).
SIO	Task is waiting for terminal I/O (RSX-11M-PLUS).
SLV	Task is slaved.
SNC	Task uses commons for synchronization (RSX-11M-PLUS).
SPN	Task is being suspended.

ATL (Cont.)

SPNA	Task was suspended prior to AST.
STP	Task is stopped for terminal input.
STPA	Task was stopped prior to AST.
WFR	Task is in a "wait-for" state.
WFRA	Task was in a "wait-for" state prior to AST.
XHR	Task has an external header (RSX-11M-PLUS).

Format:

```
ATL [taskname]
```

Example:

```
>ATL
LDR... 112050  LDRPAR 112404 00253100-00255600  PRI - 248.  DPRI - 248.
   STATUS:  -CHK FXD STP -PMD PRV NSD
   TI - CO0:  IOC - 0.  BIO - 0.  EFLG - 000001 000000  PS - 170000
   PC - 120354 REGS 0-6 120212 010364 177777 107646 074714 107614 120166
RMDEMO 053550  GEN    046020 01036700-01065600  PRI - 225.  DPRI - 225.
   STATUS:  -CHK WFR -PMD PRV MCR
   TI - TT0:  IOC - 0.  BIO - 0.  EFLG - 000021 040000  PS - 170010
   PC - 125234 REGS 0-6 000000 136257 132066 000000 136321 134560 121166
F11ACP 111550  GEN    067150 01164600-01230600  PRI - 149.  DPRI - 149.
   STATUS:  STP ACP -PMD PRV NSD CAL
   TI - CO0:  IOC - 0.  BIO - 0.  EFLG - 000002 000001  PS - 170000
   PC - 135244 REGS 0-6 000010 000066 000016 000000 067420 111550 120244
MCR... 110160  SYSPAR 114514 00202600-00212600  PRI - 160.  DPRI - 160.
   STATUS:  STP -PMD PRV MCR CLI NSD CAL
   TI - TT51:  IOC - 0.  BIO - 0.  EFLG - 000001 040000  PS - 170000
   PC - 122436 REGS 0-6 000000 120476 122032 120432 010554 043552 120366
```

BLK

BLOCK (NP,P)

The BLOCK command blocks an installed task. It declares to the system that the specified task is not eligible to execute or to compete for memory. On multiuser protection systems, nonprivileged users can only block active tasks requested from the issuing terminal. Privileged users can block any task. On systems without multiuser protection, any user can block any task.

However, the following tasks cannot be blocked: ACP tasks, CLI tasks, tasks being aborted, and tasks that are exiting.

Blocking a task sets the block bit in the Task Control Block (TCB). When a task's block bit is set, the task is ineligible to compete for system resources. To clear the block bit, issue the MCR UNBLOCK command or, if the task is active, abort the task. (Unblocking or aborting a task are the only ways to cancel the BLOCK command.)

A blocked task has an effective priority of 0. If the task is checkpointable, any task can checkpoint it. Once checkpointed, the blocked task is ineligible for memory contention. A blocked task that is then aborted is automatically unblocked by the system. If the task had previously specified a requested exit AST, the task is unblocked and the AST declared for it.

Format:

```
BLK [taskname][/TERM=TTnn:]
```

taskname

The name of the task to be blocked. If taskname is not specified, the command attempts to block the task requested from the issuing terminal (task TTnn).

/TERM=TTnn:

A privileged RSX-11M-PLUS keyword that specifies that a task initiated from the specified terminal be blocked.

Examples:

```
>BLK TST
```

Blocks task TSTT36, prohibiting it from further execution. TT36: is the terminal from which the task was initiated.

```
>BLK MAS/TERM=TT23:
```

Blocks task MAST23.

BOO

BOOT (P)

The BOOT command bootstraps a system that exists as a task image file on a Files-11 volume. It provides a convenient means of terminating one system and initiating another, especially on minimum hardware configurations. For example, BOOT can be used to terminate a real-time system and initiate a program development system.

The BOOT command immediately terminates the system currently in operation.

Bootable systems are special task image files that have no task headers. Examples of such systems are RSX-11M and RSX-11S.

Format:

```
BOO[T] [filespec]
```

filespec

The standard RSX-11M/M-PLUS file specification in the form:

```
dev:[ufd]filename.type;ver
```

This specifies the file from which a new system is to be loaded.

Defaults applied to the file specification are:

dev:	The system device LB:
[ufd]	The UIC under which BOOT is running
filename	RSX11M
type	SYS
version	The latest version

Note that BOOT is the only command that allows the file specification to omit the file name.

Table 3-1 lists all of the valid bootable devices for RSX-11M and RSX-11M-PLUS.

Table 3-1
Valid Bootable Devices

RSX-11M		RSX-11M-PLUS	
RL01/02	RP02/03	RL01/02	RC25
RK05	RP04/05/06	RK05	RP02/03
RK06/07	RS03/04	RK06/07	RP04/05/06
RM02/03/05/80	RX01/02	RM02/03/05/80	RD51
RP07	RX50	RP07	RX50
RA60	RD51	RA60	ML11
RA80/81	DECtape	RA80/81	
RC25	ML11		

BOO (Cont.)

On RSX-11M-PLUS, system images saved on one of the following devices can be transported to any of the other devices and then booted from that device (see the description of the SAVE command for more information):

ML11	RA60	RC25
RK06/07	RA80/81	RD51
RM02/03/05/80	RP04/05/06	RX50
	RP07	

Restrictions:

For a virgin system boot, the boot device physical unit number (unit plug) must equal the logical unit number in the virgin system. Otherwise, the initial SAVE command line will not work.

It is not possible to correctly boot a large virgin Executive under the following circumstances:

1. When booting a mapped RSX-11M or RSX-11M-PLUS system from an unmapped RSX-11M system

2. When booting a 22-bit RSX-11M or RSX-11M-PLUS system from an 18-bit RSX-11M system

Booting from an unmapped RSX-11M system: If the Executive being booted has anything fixed in memory above 27.5K words (for example, drivers, tasks, or commons), it will not be read into memory, causing problems when you try to run the system. This happens because BOOT moves the bootstrap code in an unmapped system to the top of memory less .5K (28K - .5K) and can only read in the virgin system image up to this location (27.5K). Anything above 27.5K is not read in.

Booting from an 18-bit RSX-11M system: If the system image being booted is larger than the running system, not all of the image will be read into memory. Again, BOOT only reads in the image up to the beginning of the bootstrap code. If the Executive has anything fixed in memory above this location, BOOT will not read it in and the new system will not run properly.

If the Executive Debugging Tool (XDT) has been generated into the system, XDT displays the following when an RSX-11M/M-PLUS system is booted for the first time:

```
XDT: baselevel

XDT>
```

where baselevel is the base level number for the system.

Typing the G key in response to the prompt returns control to RSX-11M/M-PLUS and causes the system to come up normally. After the system has been saved, XDT does not reappear unless a user sets a breakpoint or issues the BRK command, or the system crashes. (See the RSX-11M or RSX-11M-PLUS Guide to Writing an I/O Driver for a description of XDT.)

BOO (Cont.)

Example:

```
>BOO TEST
```

Bootstraps from the system device the system contained in the file TEST.SYS.

Command Error Messages:

BOO -- DEVICE NOT IN SYSTEM

The booting system does not contain the data structures needed for the device being booted.

BOO -- DEVICE OFFLINE

An attempt was made to boot a file on an off-line device.

BOO -- DPB ERROR

A bad Directive Parameter Block was created by BOOT. This error indicates that the system itself has faulted. If the error persists, submit a Software Performance Report (SPR) to DIGITAL.

BOO -- FILE NCT CONTIGUOUS

An attempt was made to load a system from a noncontiguous file. System images must be contiguous.

BOO -- INVALID LOAD DEVICE

BOOT detected a device that was invalid as a system residence device.

BOO -- LABEL BLOCK READ ERROR

An attempt was made to read the label block of the system image file, but the attempt failed.

BOO -- NOT A SYSTEM IMAGE

BOOT did not consider the file to be a system image file, probably because the file is formatted improperly.

BOO -- NO TRANSFER ADDRESS

BOOT did not consider the file to be a system image file because the specified transfer address in the label block appears to be corrupted.

BRK

BREAKPOINT TO EXECUTIVE DEBUGGING TOOL (P)

The BRK command passes control to the Executive Debugging Tool (XDT) if it has been generated into the system. If XDT is not in the system, the command has no effect. See the RSX-11M or RSX-11M-PLUS Guide to Writing an I/O Driver for a description of XDT. Note that, if successful, the command halts all system activity; proceeding from a breakpoint normally restores the system to the state that existed when the BRK command was issued.

When XDT gains control, it prints the message

```
BE:  nnnnnn
XDT>
```

on the console terminal to indicate that XDT now has control. All XDT commands are available for use in debugging the Executive or user-written drivers. To return control to MCR, enter the P command; MCR then prompts with a right-angle bracket (>).

On an RSX-11M-PLUS system, you must issue the BRK command from the console terminal.

Format:

```
BRK
```

Example:

```
>BRK
BE:  124560
XDT>P
>
```

BRO

BROADCAST (NP,P)

The BROADCAST command displays a specified message at one or more terminals, as follows:

- A privileged user can display a message at all terminals connected to the system or, in a multiuser protection system, at all logged-in terminals.
- Both privileged and nonprivileged users can display a message at any one terminal.

You can also create an indirect command file to contain one or more lines of input to the command. Each line specifies the target terminal and the message to be broadcast. (Privileged users can broadcast a message simultaneously to all terminals.) To use the command file, enter after the command name the file specification preceded by an at sign (@).

If the message cannot be broadcast within 20(10) seconds, the system displays the following message at the issuing terminal:

```
BRO -- Message failed to reach TTnn:
```

If a privileged user specifies multiple terminals (ALL: or LOG:), the system returns one error message for each busy terminal.

If you have used SET /NOBROadcast so that you will not receive any messages sent by the BRO command, the user sending the message will receive an error message.

Formats:

```
BRO[ADCAST] TTnn: message

BRO[ADCAST] @filespec

BRO[ADCAST] ALL:message (Privileged format)

BRO[ADCAST] LOG:message (Privileged format)

BRO[ADCAST] user-name message (RSX-11M-PLUS systems with Resource
                               Accounting only)
```

NOTE

Each format can be entered on two successive lines by pressing the RETURN key immediately after the command name; this invokes the direct task format. For example:

```
>BRO[ADCAST] RET
BRO>TTnn:message
```

To exit from the direct task format, type CTRL/Z.

BRO (Cont.)

TTnn:

The terminal to receive the broadcast message.

message

The message to be broadcast. This is an ASCII character string that cannot exceed the length of one line (80 characters). Note that an exclamation mark (!) cannot be broadcast.

Usually, BRO uses uppercase letters when it displays the message. When you use the direct task format, however, BRO displays the message exactly as you typed it.

filespec

The specification of a file containing one or more message lines in the format:

TTnn: message

user-name message

or, for privileged users:

ALL:message

LOG:message

ALL:

Privileged option. Indicates that the message is to be sent to all terminals connected to the system (this does not include slaved terminals, virtual terminals, or terminals that have the broadcast option disabled).

LOG:

Privileged option. Indicates that the message is to be sent to all logged-in terminals (this does not include slaved terminals, virtual terminals, or terminals that have the broadcast option disabled). In a system that does not support multiuser protection, LOG: defaults to ALL:.

user-name

The user name of the person who is to receive the broadcast message (RSX-11M-PLUS systems with Resource Accounting only). You can specify user-name to be the last name of the user (NAME) or the first initial and last name (I.NAME). You must use a blank or tab after user-name to separate it from the message text.

When you specify user-name (last name only), BRO makes an exact match between the name you enter and a name in the account file.

If the user receiving the message is logged in from more than one terminal, the message is sent to all of them.

BRO (Cont.)

The BRO command displays the message in one of the following formats:

RSX-11M systems and RSX-11M-PLUS systems without Resource Accounting

```
dd:month:yr hh:mm  From node::TTnn:              to TTnn:
message
```

RSX-11M-PLUS systems with Resource Accounting

```
dd:month:yr hh:mm  From node::user-name (ttnn:)  to TTnn:
message

dd:month:yr hh:mm  From node::user-name (ttnn:)  to user-name
message
```

The variable node is the name that was selected for your system during system generation. It is also your DECnet name if your system is on the network.

Examples:

RSX-11M systems and RSX-11M-PLUS systems without Resource Accounting

```
>BRO TT51: PRIVILEGED TESTING.  PENDING CRASH.

displays

10-AUG-81 13:35          From QUASAR::TT52:      to TT51:
 PRIVILEGED TESTING. PENDING CRASH.

>BRO (RET)
BRO>TT51: More testing.  Crash likely.

displays

10-AUG-81 13:37          From QUASAR::TT52:      to TT51:
 More testing.  Crash likely.

>BRO LOG:System going down in 5 minutes for reboot.

displays

10-AUG-81 13:40          From QUASAR::TT52:      to TT51:
 SYSTEM GOING DOWN IN 5 MINUTES FOR REBOOT.
```

RSX-11M-PLUS systems with Resource Accounting

```
>BRO TT35: This is a test.

displays

10-AUG-81 13:10          From CASTOR::SMITH (TT30:)      to TT35:
 THIS IS A TEST.

>BRO JONES THIS IS ANOTHER TEST.

displays

10-AUG-81 13:10          From CASTOR::SMITH (TT30:)      to JONES
THIS IS ANOTHER TEST.
```

BRO (Cont.)

Note:

The BROADCAST command uses the write-breakthrough feature of the terminal driver, a system generation option always generated with an RSX-11M multiuser protection system and all RSX-11M-PLUS systems. If the system supports the feature, the broadcast message, under most circumstances, reaches all target terminals. If the system does not support the write-breakthrough feature, the write defaults to a write logical block; the message cannot break through any type of I/O at the terminal.

Command Error Messages:

BRO -- CAN'T FIND user

(RSX-11M-PLUS systems with Resource Accounting only.) A message was sent, using the user-name format, but the user is not logged in.

BRO -- COMMAND INPUT ERROR

The BROADCAST task did not receive the command line. (Usually an indirect command file could not be found.) Reenter the command line.

BRO -- COMMAND SYNTAX ERROR

The command line had an improper format.

BRO -- ILLEGAL DEVICE SPECIFIED

The specified device was not a terminal.

BRO -- MESSAGE FAILED TO REACH TTnn:

The message could not be displayed within 20(10) seconds at the terminal specified by TTnn:.

BRO -- PRIVILEGED COMMAND

A nonprivileged user entered a privileged option of the command, that is, attempted to broadcast one message to all connected or logged-in terminals.

BRO -- USER NOT RECEIVING MESSAGES

The terminal to which the message was sent has been SET /NOBROadcast.

BYE

BYE (NP)

The BYE command logs you out of a multiuser protection system. The system writes a logout message on the console terminal (CO:), displays a terminating message on the initiating terminal, aborts any active nonprivileged and some privileged tasks that belong to you, dismounts volumes mounted by you (an exception is when you are a privileged user and you have mounted a public device -- mounted public volumes remain mounted), and deallocates any private devices you had allocated previously.

Upon logging out a terminal, BYE performs the following actions:

1. Checks to see if the terminal's current command line interpreter (CLI) has requested a silent logout. If so, BYE does not display any information and does not execute the system logout command file.

2. If silent logout is not requested, BYE resets the default CLI for the terminal to MCR, resets the terminal so that it can receive broadcast messages, and executes LB:[1,2]SYSLOGOUT.CMD, the system logout command file.

   On RSX-11M-PLUS, the system logout command file is not executed on a virtual terminal.

3. Informs the full-duplex terminal driver or DECnet that the terminal is logging out. BYE issues a QIO directive that the terminal driver uses to hang up remote lines or that DECnet uses to break the connection.

   This action can be controlled by the /[NO]HOLD keyword. If you specify /HOLD, BYE logs out the terminal but the line is not hung up. If you specify /NOHOLD, BYE logs out the terminal and the line is hung up. (/NOHOLD is the default.)

The way in which BYE aborts (or does not abort) a task active on the terminal being logged out depends on the task and its privilege status.

All tasks with abort ASTs and all nonprivileged tasks that are active at your terminal when you issue the BYE command are aborted. If a nonprivileged task has requested an exit AST service routine by means of a SPECIFY REQUESTED EXIT AST directive (SREA$ or SREX$), BYE allows the task to enter this service routine. BYE requests each of these tasks to exit (abort), causing the requested exit AST to be entered for the task. For all of these nonprivileged tasks, BYE allows a user-specified time interval during which the AST can be executed for the task. At the end of the time interval, which is specified when the BYE task is built (the default is 0 or not to wait at all), if the task has not exited or if the AST service routine has not been entered, BYE aborts the task normally (a second requested exit AST cannot be declared for a nonprivileged task) and also aborts any other nonprivileged tasks that are still active.

BYE (Cont.)

BYE aborts a privileged task that has requested an AST service routine in the same way as a nonprivileged task. However, any privileged tasks that have not exited by the end of the time interval are not necessarily aborted. The task itself must determine if it will be aborted or not. Privileged tasks that did not request the AST service routine remain active.

Format:

```
BYE [/[-][NO]HOLD]
```

Example:

```
>BYE
Have a Good Evening
13-May-81 18:47 TT13: is logged off QUASAR
```

Depending on the time of day, the system displays "Have a Good Morning," "Have a Good Afternoon," or "Have a Good Evening."

On RSX-11M-PLUS systems that support CPU accounting, the BYE command provides additional information (provided that you logged in after CPU accounting was initiated). The additional information consists of the total time logged in, the amount of CPU time used, and the total number of tasks.

Example:

```
>BYE
Connect time:  172   MINS.
CPU time used: 63    SECS.
Task total:    48
Have a Good Afternoon
14-MAY-81 17:23 TT:30 Logged off CASTOR
```

Note that some tasks, including BYE, spawn or request other tasks. These other tasks are also included in the task total. For example, when you issue a RUN-immediately command, the CPU accounting system records three tasks: the MCR task to execute the RUN command, INSTALL to install the task, and the actual execution of the task.

Command Error Message:

```
BYE  -- SYNTAX ERROR
```

A keyword other than a form of /HOLD (/HO[LD],/NOHO[LD], /-HO[LD]) was specified in the command line.

CAN

CANCEL (NP,P)

The CANCEL command cancels time-based initiation requests for a task. These requests result from a RUN$ directive or any of the time-synchronized variations of the MCR RUN command and are placed in the clock queue. (Note that you must be privileged to use these forms of the RUN command.)

Only a privileged user can issue a CANCEL command for a task not initiated from the entering terminal.

CANCEL does not affect execution of a currently active task. CANCEL removes only the time-based schedule requests still in the clock queue.

Format:

CAN[CEL] taskname

where taskname is the name of the task.

Example:

>CAN XKE

Cancels all periodic rescheduling and time-based initiation requests for task XKE.

CBD

COMMON BLOCK DIRECTORY (NP)

This command is valid only on RSX-11M-PLUS systems.

The CBD command displays information about all entries or a specific entry in the Common Block Directory. The Common Block Directory is a table of all named common regions and libraries installed in the system.

The display contains the following information for each named common region:

- Common region name
- Partition Control Block (PCB) address
- The number of tasks mapped to the common region
- Common region status bits. The following is a list of the status bits and their meanings:

CAF	Checkpoint allocaton failure
-CHK	Not checkpointable
CKP	Checkpoint in progress
CKR	Checkpoint requested
COM	Library or common
DEL	Delete on last detach
DRV	Driver common
FXD	Fixed in memory
LIO	Long I/O
LFR	Last load failed
NSF	Not shuffleable
OUT	Out of memory
PER	Parity error
PIC	Position independent
RON	Read-only common

Usually, the status bits will indicate that the common region is either fixed in memory (FXD) or out of memory (OUT).

An optional keyword (/TASKS) displays a list of all tasks attached to a specific common region and the number of times each task has mapped to the common region (mapping count).

Format:

```
>CBD [common-region-name [/TASKS]]
```

common-region-name

The name of a specific common region.

/TASKS

Instructs the command to display the names of each task attached to a specific common region and the number of times the task has mapped to the region (mapping count).

CBD (Cont.)

Examples:

```
>CBD
BASIC2   050534    0 STATUS:  OUT COM
DEPRES   063154    0 STATUS:  OUT COM
FCSSUP   052714    0 STATUS:  OUT COM
RMSRES   045264    1 STATUS:  COM
TTCOM    116570    1 STATUS:  FXD,COM
```

Displays all named common regions, PCB addresses, mapping count, and status.

```
>CBD BASIC2
BASIC2   042570    0 STATUS:  OUT COM
```

Displays information for the BASIC2 entry.

```
>CBD RMSRES/TASKS
RMSRES   045264    1 STATUS:  COM
         DEVICE    1
```

Displays information for the RMSRES entry as well as all tasks that have attached to the common region.

CLI

COMMAND LINE INTERPRETER (P,NP)

The CLI command sets up for use a command line interpreter other than MCR, such as DCL or a user-written CLI. A CLI task receives unsolicited input from a terminal and then attempts to interpret the input as a command. On RSX-11M, you can have up to 15 alternate CLIs running on your system at one time (the number is selected when the system is generated). On RSX-11M-PLUS, the number is always 16, which includes MCR.

Before you use an alternate CLI, it must be installed with the /CLI=YES option. (See the description of the INSTALL command.)

All of the CLI command keywords and subkeywords can be truncated to three characters.

Formats:

```
CLI /keyword=cliname

CLI /INI[T]=cliname[/subkeyword(s)]
```

cliname

The name of the alternate CLI. This name can be 1 to 6 characters in length.

Keywords:

/DISABLE=cliname

Disables the specified CLI. The CLI cannot accept any commands. This effectively stops system use by terminals set to this CLI until the CLI is enabled again. The system sends a message to the CLI informing it that it has been disabled if the CLI was initialized with the /MESSAGE subkeyword specified.

/ELIM=cliname or /ELIM=*

Removes all of the data structures for the specified CLI or, if the wildcard (*) is used, for all of the alternate CLIs. After this command is executed, the CLI task can be removed (see the description of the REMOVE command).

Individual CLIs can be eliminated only if no terminals are set to them. When you use the wildcard option, all CLIs except MCR are eliminated. Any terminals set to a non-MCR CLI are disabled. The terminals can be enabled again by setting them to any valid CLI (after it has been initialized) or to MCR (which does not need to be initialized). CLIs that were initialized with the /MESSAGE subkeyword receive a message from the system informing them that they have been eliminated.

/ELIM=* is intended to be used during the system shutdown procedure.

CLI (Cont.)

/ENABLE=cliname

Enables a previously disabled CLI. The CLI can now accept commands. If the CLI was initialized with the /MESSAGE subkeyword specified, the system sends a message to the CLI informing it that it is now enabled.

While a CLI is disabled, the terminal remains set to it. To set the terminal to an enabled CLI, issue the SET /CLI command from another terminal (privileged users only).

/INIT=cliname[/subkeyword(s)]

Initializes the data structures for the specified CLI so that terminals can be set to it. The CLI task must have been installed with the /CLI=YES option. All CLIs except MCR must be initialized before they can be used.

If the /MESSAGE subkeyword is specified, the system sends a message to the CLI, informing the CLI that it has been initialized.

Subkeywords:

/CPR="string"

Specifies the CTRL/C prompt string. The string inside the quotation marks has the same syntax as the MACRO-11 .ASCII directive (see the PDP-11 MACRO-11 Language Reference Manual) You must supply characters such as RETURN (<15>) and LINE FEED (<12>) because they are not supplied automatically. For example:

/CPR="<15><12>/MCR>/"

sets up the string for MCR's CTRL/C prompt. This means that when you type a CTRL/C, the system issues a RETURN/LINE FEED and then displays the prompt MCR>.

A null string (/CPR="") specifies that no prompt will be issued.

If you want to use double quotation marks or slashes within the string, use different characters as the string delimiters. (The delimiters can be any character that is not used in the string.)

Default: /CPR="<15><12>/cli/" where cli is the name of the CLI.

CLI (Cont.)

/DISABLE

Initializes the CLI in disabled mode. The system rejects any commands issued from the terminal until the CLI is enabled.

Default: The CLI is enabled.

/DPR="string"

Specifies the default prompt to be issued when an empty command line is entered. As with /CPR, the string inside the double quotation marks has the same syntax as the MACRO-11 .ASCII directive. You must supply characters such as RETURN (<15>) and LINE FEED (<12>) because they are not supplied automatically.

A null string (/DPR="") specifies that no prompt should be issued.

If you want to use double quotation marks or slashes within the string, use different characters as the string delimiters. (The delimiters can be any character that is not used in the string.)

Default: /DPR="<15><12>/>/"

/LGO

Specifies that the CLI will accept commands from unlogged-in terminals. This allows the CLI to execute the commands without the user having to log in. An application can, for example, use the terminal for data entry only and not allow it access to the system. The terminal is under complete control of the CLI task. You can only do what the CLI allows.

It is up to the CLI to do any user validation or security checks. Also, be careful when doing any file I/O from tasks running on an unlogged-in terminal because the UIC and privileges for the terminal are undefined.

Default: Commands from unlogged-in terminals will be rejected by the system and not passed to the CLI.

CLI (Cont.)

/MESSAGE

Specifies that the CLI wants to receive messages from the system. The system messages inform the CLI of events such as its being enabled or disabled, or if a terminal is being set to the CLI or if it is being dissociated from the CLI. (See the RSX-11M/M-PLUS System Management Guide for a list of the messages and their format.)

Default: The CLI does not receive messages from the system.

/NULL

Specifies that the CLI will accept empty command buffers resulting from a user pressing the RETURN key as the first character in a command line. No prompt is issued.

Default: The command is not passed to the CLI and the default prompt is issued.

/PRIV

Specifies that a user must be privileged to set the terminal to the CLI. (See the description of the SET command.)

Default: A nonprivileged user can set his or her own terminal to the CLI.

/PROMPT

Specifies that the CLI wants to receive prompt requests if a task that was started in order to execute a command exits.

Default: The dispatcher issues a prompt and the request is not passed to the CLI.

/QUIET

Specifies that the MCR commands HELLO and BYE do silent logins and logouts, respectively. (See the descriptions of these commands.) The keyword also suppresses messages from the dispatcher.

CLI (Cont.)

/RESTRICT

Specifies that only the CLI can issue the SCLI$ directive to set a terminal to itself. (See the RSX-11M/M-PLUS Executive Reference Manual.)

Note that you cannot use /RESTRICT for CLI tasks whose names are in the form ...xxx.

/SNGL

(RSX-11M-PLUS systems only.) Specifies that the dispatcher accept single-line commands only. A hyphen immediately before a RETURN will not be interpreted as a continuation line indicator; it remains part of the text.

/TASK=taskname

Specifies the name of the task that will act as the CLI. Use this keyword if the name of the task is different from the name of the CLI.

/MESSAGE=cliname:"message-text"

Sends an ASCII message to the CLI if it has the message attribute set for it (by the /MESSAGE subkeyword). If the CLI does not have the attribute set, the command issues an error message.

/SHOW

(Nonprivileged keyword.) Displays information about each CLI on the system. The information includes the name of the CLI, the task that implements the CLI, the number of terminals set to the CLI, several status bits for the CLI, and whether the CLI is active.

The following list gives the meaning of the status bits:

ACT	CLI is active (always shown for MCR).
DSB	CLI is currently disabled.
PRV	CLI was initialized with the /PRIV subkeyword. You must be privileged to set a terminal (including TI:) to this CLI.
RST	CLI was initialized with the /RESTRICT subkeyword. Only the CLI can set a terminal to itself.

CLI (Cont.)

/UNOVR

Clears the override bit set for the terminal's CLI. When the HELLO command enters the command file LB.[1,2]SYSLOGIN.CMD, the terminal is set to a specific CLI. However, an override bit is also set so that the command file can execute from MCR. Clearing the override bit ensures that commands issued from the terminal will go to the correct CLI.

/UNOVR is only useful with SYSLOGIN.CMD, immediately before chaining to a user's LOGIN.CMD, or exiting.

Examples:

```
>CLI /SHOW
MCR         MCR...  9  ACT
DCL         ...DCL  0
```

Displays information about the CLIs currently installed in the system.

```
>CLI /INI=TCP/LGO/MES/TASK=PROMPT
```

Initializes the task PROMPT as a CLI. The command line specifies that the CLI will be called TCP, it will accept commands from unlogged-in terminals, and it will receive messages from the system. (Note that PROMPT must first be installed with the /CLI=YES option before it can be initialized as a CLI.)

Command Error Messages:

CLI -- CLI ALREADY EXISTS

You attempted to initialize a CLI that already exists in the system.

CLI -- CLI DOES NOT ACCEPT MESSAGES

The CLI was not initialized with the /MESSAGE keyword, so its message attribute bit has not been set. The CLI is unable to receive any messages.

CLI -- CLI IN USE

You attempted to eliminate a CLI that still has terminals set to it.

CLI -- DEVICE ATTACHED

The CLI command cannot do a /SHOW display because another task has attached the terminal.

CLI (Cont.)

CLI -- FEATURE NOT SUPPORTED

The system does not support alternate CLIs.

CLI -- ILLEGAL KEYWORD VALUE

You specified an invalid string with the /CPR or /DPR subkeyword.

CLI -- ILLEGAL USE OF RESTRICT SWITCH

A CLI cannot be initialized with /RESTRICT if the name of the CLI task is in the form ...xxx.

CLI -- INVALID KEYWORD

An incorrect keyword was specified in the command line.

CLI -- MAX NUMBER OF CLIS ALREADY PRESENT

You attempted to initialize another CLI, but the maximum number of CLIs allowed in the system has already been reached.

CLI -- NO POOL SPACE

Not enough space in pool is present to do the operation specified in the command line.

CLI -- OUTPUT ERROR

An I/O error occurred while output was being sent to the terminal.

CLI -- PARTITION TOO SMALL TO BUFFER INFORMATION

The /SHOW subkeyword did not have enough space to buffer the display information. Try reinstalling the MCR task with a larger increment, using the /INC keyword (see the description of the INSTALL command). If the error persists, submit a Software Performance Report (SPR).

CLI -- PRIVILEGED COMMAND

Nonprivileged users can only use the /SHOW keyword.

CLI -- SYNTAX ERROR

The command line was not entered correctly.

CLI -- TASK NOT A CLI

You attempted to initialize a CLI task that was not installed with the /CLI=YES keyword.

CLI -- TASK NOT IN SYSTEM

The specified CLI task has not been installed or you attempted to eliminate a CLI whose name is unknown to the system.

CLQ

CLOCK QUEUE (NP)

The CLOCK QUEUE (CLQ) command displays on the entering terminal information about tasks currently in the clock queue. The information consists of the task names, the next time each task is to be run, and each task's reschedule interval, if one was specified. The system places a task in the clock queue if the task was activated by the RUN command, which specified a time-based option, or by the RUN$ directive.

Format:

```
CLQ[UEUE]
```

Example:

```
>CLQ
TASK1 Scheduled at 22-APR-81 10:24:30:00
TASK2 Scheduled at 22-APR-81 10:30:00:00 Reschedule interval 30M
>
```

The first task in the queue will run at 10:24:30:00 (hour: minute: second: clock tick); it has not been rescheduled. The second task in the queue will next run at 10:30:00:00 and is scheduled to run every 30 minutes.

DCL

DIGITAL COMMAND LANGUAGE (NP)

The DCL command allows you to issue DCL commands from a terminal that is set to MCR. Instead of MCR processing the command line, DCL processes it. The DCL task must be installed before it can do command processing. See the RSX-11M/M-PLUS Command Language Manual for descriptions of the DCL commands.

Format:

DCL command-line

Examples:

>DCL SET DEF LB:

Issues the DCL command that sets the default device for the entering terminal to be LB: (the system device).

>DCL TYPE [303,24]USERS.TXT

Issues the DCL command that displays a file on the entering terminal. The file is USERS.TXT, which is in UFD [303,24].

DEA

DEALLOCATE (NP,P)

The DEALLOCATE command releases a private (allocated) device, thereby allowing other users to access it. (This command applies only to systems that support multiuser protection.) Nonprivileged users can only deallocate private devices that they themselves have allocated.

A privileged user can deallocate any device in the system.

Note that when an owner of a private device logs out (issues the BYE command), the system deallocates all that user's private devices. However, if the system detects an error while attempting to deallocate a device, it stops and does not deallocate that device or any remaining devices. The related error message does not state which device caused the error.

If an allocated device has been mounted, it must be dismounted before you deallocate the device.

Format:

DEA[LLOCATE] [ddnn:]

ddnn:

The device unit name and number of the private device to be deallocated. If the command line does not specify a device unit, the system deallocates all private devices owned by the user logged in on the issuing terminal.

Example:

>DEA DM:

Deallocates disk DM:. The deallocated device can now be mounted or allocated by other users.

DEB

DEBUG (DB,F)

This command is valid only on RSX-11M-PLUS systems.

The DEBUG command forces a task to trap to a debugging aid by setting the T-bit in the task's Processor Status Word (PSW). To debug a task, it must have been built with the /DA switch (see the RSX-11M/M-PLUS Task Builder Manual) or have issued a SPECIFY SST VECTOR TABLE FOR DEBUGGING AID directive (SVDB$; see the RSX-11M/M-PLUS Executive Reference Manual).

Nonprivileged users can debug any nonprivileged task that was initiated from their own terminals (TI:). Privileged users can debug any task.

Tasks for which you might want to use the DEBUG command to facilitate debugging are those that are in an infinite loop or that are waiting for an incorrect or nonexistent event flag.

If you enter the DEBUG command, but no debugging aid was specified for the task, you will get the error message "Task does not contain a debugging aid."

Format:

```
DEB[UG][taskname]
```

taskname

The name of the task that you want to debug. If you do not specify a task name, DEBUG looks for task TTnn, which is the task currently running from your terminal.

Examples (using ODT as the debugging aid):

```
>DEB VT3
TE:001264
_
```

Allows the task named VT3 to be debugged with ODT. After the DEBUG command is issued, ODT displays the T-bit exception code and the octal address following the location in error and issues its prompt. You can then proceed with the debugging. (ODT is documented in the IAS/RSX-11 ODT Reference Manual.)

```
>DEB
TE:002452
_
```

Assumes that the task named "TTnn" (depending on the type and unit number of the terminal) is the one to be debugged, again using ODT.

DEB (Cont.)

Command Error Messages:

DEB -- PRIVILEGED COMMAND

Nonprivileged users cannot debug tasks that were not initiated from their own terminals.

DEB -- TASK NOT IN SYSTEM

An attempt was made to debug a task that does not exist. Reenter the command line, specifying the correct task name.

timestamp *** TASK "taskname" DOES NOT CONTAIN A DEBUGGING AID

An attempt was made to debug a task that was not built with the Task Builder's /DA switch. Such tasks cannot be debugged.

DEV

DEVICES (NP,P)

The DEVICES command displays the symbolic names of all devices or all of a particular device type or the name of a specific device. The device names appear in one column; second and subsequent columns contain additional information about each device.

Formats:

```
DEV[ICES]
DEV[ICES] dd:
DEV[ICES] ddnn:
DEV[ICES] /LOG
```

dd:

The type of devices for which you want the information to be displayed.

ddnn:

The specific device for which you want the information to be displayed.

/LOG

Displays all logged-in terminals.

On RSX-11M-PLUS systems, when you specify a terminal or /LOG, the display includes the login and default UICs. Also, if Resource Accounting is running, the display includes the date and time of login, the number of tasks currently active, and the first initial and last name of each logged-in user.

Examples:

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```
>DEV
DB0:    Public Mounted Loaded Type=RP06
DB1:    Public Mounted Loaded Nowrite Type=RP05
DB2:    Public Mounted Loaded Type=RP05
DB3:    TT60: - Private Loaded Type=RP05
DB5:    Offline Loaded Type=RP05
DM0:    Loaded Nowrite Type=RK06
DM1:    TT60: - Private Loaded Type=RK06
DR0:    Offline Loaded Type=RM03
DR1:    Loaded Type=RM03
LP0:    Public Loaded
MM0:    TT60: - Private Loaded
MM1:    TT10: - Private Loaded
TT0:    Loaded
TT1:    Loaded
TT2:    [312,1] - Logged On Loaded
TT3:    Loaded
TT4:    [302,310] - Logged on Loaded
TT5:    Loaded
```

DEV (Cont.)

```
TT6:    [306,14] - Logged On Loaded
TT7:    [50,25] - Logged On Loaded
TT10:   [306,50] - Logged On Loaded
CO0:    Loaded
NL0:
TI0:
CL0:    LP0:
LB0:    DB0:
SY0:    DB0:
>
>DEV    /LOG
TT2:    [312,1]
TT4:    [302,310]
TT6:    [306,14]
TT7:    [7,25]
TT10:   [306,50]
>
>DEV DB1:
DB1:    Public Mounted Loaded Nowrite Type=RP05
>
>DEV TT30:
TT30:   [7,30]          [7,30]
        CLI   = MCR     BUF   = 80.     HFILL = 0       SPEED=(9600:9600)
        LINES = 24.     TERM  = VT52    OWNER = NONE    BRO     NOABAUD
        LOWER   PRIV    NOHOLD  NOSLAVE NOESC   CRT     NOFORM  NOREMOTE
        ECHO    NOVFILL HHT     NOFDX   WRAP    NORPA   NOEBC   TYPEAHEAD
```

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```
>DEV DB: (if privileged)
DB0:     Offline Loaded Type=unknown
DB1:     Offline Loaded Type=unknown
DB2:     Mounted Loaded Label=DEVUTIL Type=RP05
DB3:     Public mounted Loaded Label=USERS1 Type=RP06
>
>DEV TT23:
TT23:   [7,20]    [7,20]        2-FEB-81 10:20  0       J. WHITE
        CLI   = MCR     BUF   = 80.     HFILL = 0       SPEED=(9600:9600)
        LINES = 24.     TERM  = VT100   OWNER = NONE    BRO     NOABAUD
        LOWER   PRIV    NOHOLD  NOSLAVE NOESC   CRT     NOFORM  NOREMOTE
        ECHO    NOVFILL HHT     NOFDX   WRAP    NORPA   NOEBC   TYPEAHEAD
>
>DEV /LOG
TT11:           [304,6]   [7,306]       2-FEB-81 08:28  1       R. SMITH
TT12:           [7,25]    [7,25]        2-FEB-81 08:42  1       M. BROWN
TT13:           [7,201]   [7,201]       2-FEB-81 10:24  1       J. STORM
TT15:           [7,325]   [7,325]       2-FEB-81 08:08  0       P. JONES
```

Notes:

The following notes describe the information that can appear in the subsequent columns.

- MOUNTED indicates that the device is mounted. If a privileged user issues the command, the display includes the volume label.
- PUBLIC indicates that the device has been set public.

DEV (Cont.)

- NOWRITE indicates that the volume is software write-locked (write operations are not allowed on the volume).
- TYPE indicates the device type.
- MARKED FOR DISMOUNT indicates that a mountable device has been requested to be dismounted, but the dismount operation has not yet been completed.
- OFFLINE indicates that, although the system tables contain entries for this device, the host configuration does not contain the related device, or the device was powered down at the time of the boot.

  On RSX-11M-PLUS, OFFLINE also indicates that the device has not been brought on line.
- [uic] LOGGED ON indicates that the user identified by [uic] (the protection UIC) has logged in on the terminal.
- LOADED indicates that a loadable device driver is currently loaded.
- UNLOADED indicates that a loadable device driver is currently not loaded.
- A device name in the second column is the device to which the corresponding device in the first column has been redirected.
- A terminal name in the second column followed by the text "- PRIVATE" indicates that the device named in the first column has been allocated to the user logged in on the terminal in the second column.
- The lines in the display for a specific terminal list the characteristics that have been set for the terminal. The description of the SET command gives all of the available characteristics.

DMO

DISMOUNT (NP,P)

The DISMOUNT command requests the file system to mark the volume for dismount and release the control blocks. Marking a volume for dismount prevents programs from opening additional files on the volume. After all files open on the volume are closed, the Ancillary Control Processor (ACP) releases the control blocks and dismounts the volume.

If a single user has mounted a volume, the DISMOUNT command declares the volume logically off line. If multiple users have mounted a volume, the volume remains accessible until all users have dismounted it.

When you dismount a volume, the DISMOUNT command prints on your terminal a message about whether or not a final dismount has been initiated. When the dismount operation completes, either through the Files-11 disk system or the ANSI magnetic tape system (ANSI X3.27-1978), the command prints on the console terminal (CO:) the message:

```
*** ddnn:  DISMOUNT COMPLETE
```

NOTE

Do not remove the volume until after you have received this message. If you remove the volume beforehand, it might be corrupted and the next volume placed on the device drive will probably become corrupted.

There may be a considerable delay between the time you issue the command and the printing of this message if a number of I/O requests are pending and/or a number of files are open on the volume.

Nonprivileged users can only dismount volumes that they have mounted. A privileged user can dismount any mounted volume.

On RSX-11M-PLUS systems, you cannot dismount a volume on a shadow device; you must first stop shadow recording (see the RSX-11M/M-PLUS System Management Guide).

Formats:

```
>DMO ddnn:  [["]label["]] [/keyword(s)]

>DMO /USER [/keyword(s)]
```

DMO (Cont.)

ddnn:

The device unit that holds the volume to be dismounted.

label

The Files-11 volume label may be up to 12(10) characters in length for disk and DECtape, and up to six characters for magnetic tape. It is used to verify that the proper volume is being dismounted. A volume label is optional (if the command omits a label, no volume label check is performed).

If a volume label for a magnetic tape contains special characters, it must be enclosed in quotation marks. See the description of the MOUNT command for the list of special characters.

Keywords:

/DEV

(Privileged keyword.) Dismounts all users from a specific device. This keyword must be specified if you are dismounting a public device.

/USER

Dismounts all volumes that a user has mounted.

/TERM=ttnn:

(Privileged keyword.) Dismounts all volumes that a user at the specified terminal has mounted.

/LOCK=option

Allows logical I/O to a volume after it is dismounted. If the drive supports software spin-down, you can also specify whether or not the disk should be left spinning after the dismount. For magnetic tapes, /LOCK can be used to dismount and remount a tape without having to reload the tape.

On RSX-11M, /LOCK is valid only for magnetic tape volumes.

On RSX-11M-PLUS, /LOCK is valid for magnetic tapes and DB:-, DM:-, and DU:-type disks.

The options for the /LOCK keyword are:

```
/LOCK=Nounload
/LOCK=Unload
/LOCK=Virtual
```

When you specify the Nounload option (/LOCK=N), DISMOUNT clears the volume valid bit and does not spin down the disk or unload the tape. This option only inhibits access to the volume. This option is the default lock value for volumes mounted as foreign and with no ACP specified. (See the description of the MOUNT command.)

DMO (Cont.)

When you specify the Unload option (/LOCK=U) for disks, DISMOUNT clears the volume valid bit and, if the drive supports the spin-down function, spins down the disk. When you specify /LOCK=U for tapes, DISMOUNT rewinds and unloads the tape. Depending on the hardware, this may only place the unit off line at load point or it may completely unload the tape and close the autoload tape ring. The /LOCK=U option is the default lock value for all volumes mounted with a standard ACP. The usual procedure after dismounting a volume that uses a standard ACP is to remove the volume from the drive.

On RSX-11M-PLUS systems, you can spin down the removable unit of a multiunit device (for example, the RC25; please note that upon dismounting an RC25, you will be spinning down the system disk) only if you are privileged. If you are nonprivileged and you try to dismount the unit or specify /LOCK=U in the command line, you will get a warning message that the volume cannot be spun down.

The Virtual option is privileged. When you specify /LOCK=V, DISMOUNT does not clear the volume valid bit and does not spin down the disk or unload the tape. The Executive still permits logical I/O to the volume. For example, the task image of an installed task can reside on a disk that has been dismounted with the /LOCK=V option. However, the file system cannot access the volume. This option is the default when dismounting the system disk prior to saving the system.

Examples:

```
>DMO DM1:AMBER
```

Dismounts the volume labeled AMBER on device unit DM1:. If a single user has mounted the volume, the command dismounts the volume. If more than one user has mounted the volume, the volume remains mounted for the other users.

```
>DMO DM1:/DEV
```

Places the volume on device unit DM1: logically off line and releases all co trol blocks. Users can no longer access the device.

```
>DMO /USER/TERM=TT17:
```

Dismounts all volumes mounted by terminal TT17:.

```
>DMO DK0:
DMO -- TT60:   dismounted from DK0:    *** Final dismount initiated ***
```

Begins the dismounting process for DK0:. When the DISMOUNT COMPLETE message is printed on the console terminal, the volume can be removed from the drive.

DMO (Cont.)

Command Error Messages:

DMO -- WARNING -- ALL UNITS OF MULTIUNIT DRIVE WILL SPIN DOWN ddnn:

(RSX-11M-PLUS systems only.) When a unit of a multiunit device is spun down (by a privileged user), all other units of the device are also spun down.

DMO -- WARNING -- TASKS INSTALLED FROM ddnn:

The disk being dismounted has tasks installed from it. DMO dismounts the disk, but you can still run the tasks until the disk has spun down. Use the TAS command to find out which tasks are installed.

DMO -- WARNING -- TASKS INSTALLED FROM ddnn: - TASKS DISABLED

(RSX-11M-PLUS systems only.) The diak is being dismounted with the /LOCK=N or LOCK=U option rather than with /LOCK=V. Tasks installed from the disk are no longer executable.

DMO -- WARNING -- VOLUME WILL NOT SPIN DOWN ddnn:

(RSX-11M-PLUS systems only.) An attempt was made by a nonprivileged user to spin down the removable unit of a multiunit device, either implicitly with the DMO command or explicitly by specifying /LOCK=U in the command line. Only privileged users can spin down multiunit devices. (For nonprivileged users, the volume is logically dismounted but not spun down.)

DMO -- CHECKPOINT FILE STILL ACTIVE

The command attempted to dismount a volume that contained an active checkpoint file. The volume cannot be dismounted until the checkpoint file has been discontinued. Issue an ACS command to discontinue the file and reissue the DMO command when the system issues a message to indicate that the checkpoint file is inactive.

DMO -- DISMOUNTING SYSTEM DISK

This message should only occur during a system generation or during system shutdown. Since the system disk is a public device, it can be dismounted only by a privileged user.

DMO -- DISMOUNT IS NOT NECESSARY FOR CASSETTES

Self-explanatory. This is an informational message only.

ddnn: IS ATTACHED BY TASK taskname

DMO attempted to dismount an attached device. Because DMO processes the mount list several times before exiting, a device could be dismounted if the task to which it belongs detaches before DMO exits. If the device is dismounted, a normal dismount message appears later.

DMO (Cont.)

DMO -- NO VOLUME LIST

The command specified a magnetic tape for which a mounted volume label list does not exist.

DMO -- SHADOW RECORDING IS ACTIVE ON ddnn:

(RSX-11M-PLUS systems only.) The command specified a shadow device. Shadow devices cannot be dismounted; first stop shadow recording and then reenter the command.

TOO MANY DEVICES ATTACHED, NO FURTHER ATTACH MESSAGES

DMO issues this message when eight (or more) devices are attached during a DMO /USER operation. A message is printed for the eighth device, but not for any number over that.

DMO -- VOLUME NOT MOUNTED

The specified device was not mounted.

DMO -- VOLUME NOT MOUNTED BY TI:

The command specified a dismount operation for a volume that was not mounted from the issuing terminal or the command specified the wrong device name for a tape set.

DMO -- WRONG VOLUME LABEL

The volume label and the label specified in the command did not match.

FIX

FIX-IN-MEMORY (P)

The FIX command loads and locks a task into its partition. Subsequent requests for running the task are serviced more quickly because the task is memory-resident and does not have to be loaded from the disk before it can run. The system can fix a task in memory only when the partition in which it is to be fixed becomes available.

Fixed tasks remain physically in memory even after they exit. Therefore, they do not have to be reloaded when a request is made to run them. (Note that reexecuting fixed tasks is not always practical; to reexecute, the task must initialize all impure data and LUN assignments at run time.) Only an UNFIX or REMOVE command can free the occupied memory partition.

The following restrictions apply to the fixing of tasks:

- On RSX-11M systems, checkpointable tasks cannot be fixed. On RSX-11M-PLUS systems, checkpointable tasks should not be fixed because fixing a checkpointable task makes the task noncheckpointable.
- On RSX-11M-PLUS systems, tasks whose names are in the form ...xxx and xxx$$$ cannot be fixed because that copy of the task is never executed. (The task is a prototype task.)
- Active tasks cannot be fixed.
- A task must be installed before it can be fixed.

Format:

```
FIX taskname[/keyword]
```

The variable taskname is the name of the task to be fixed in memory.

On RSX-11M-PLUS systems, the FIX command accepts two keywords. The keywords allow you to fix common task regions in a partition. These keywords are:

/REG - Fix a region.

/RON - Fix a common, read-only segment of a multiuser task.

The format is:

```
FIX region-name/REG
```

or

```
FIX taskname/RON
```

When fixing a common, read-only segment of a multiuser task, you must type the full name of the multiuser task.

FIX (Cont.)

Examples:

>FIX XKE

Fixes task XKE in its partition.

>FIX FCSRES/REG

(RSX-11M-PLUS systems only.) Fixes the resident library for FCS in its partition.

>FIX ...MAC/RON

(RSX-11M-PLUS systems only.) Fixes the read-only segment of the MACRO-11 assembler in its partition.

Command Error Messages:

FIX -- PARTITION BUSY

The partition in which the task was to be fixed was occupied, so the task could not be fixed.

FIX -- TASK ACTIVE

The specified task is already active. Active tasks cannot be fixed.

FIX -- TASK ALREADY FIXED

The specified task was already fixed in memory.

FIX -- TASK BEING FIXED

The specified task was already being fixed.

FIX -- TASK CHECKPOINTABLE

(RSX-11M systems only.) A checkpointable task cannot be fixed in memory. Remove the task and install it as noncheckpointable (/CKP=NO). You can then fix the task in memory.

FIX -- TASK HAS NO READ ONLY SEGMENT

An attempt was made to fix the read-only segment of a multiuser task, but the spcified task does not have a read-only segment.

FIX -- TASK NOT IN SYSTEM

The specified task has not been installed in the system. An uninstalled task cannot be fixed.

FLA

GROUP GLOBAL EVENT FLAGS (NP,P)

The FLA command creates, eliminates, or displays group global event flags. Group global event flags provide each UIC group with 32 event flags in addition to the 32 common and 32 local event flags. Group global event flags are similar in use to the common event flags (see the RSX-11M/M-PLUS Executive Reference Manual). However, only those tasks running under the same group UIC can use the group global event flags for that group.

Nonprivileged users can only create or eliminate group global event flags for their login group UIC.

Privileged users can create or eliminate group global event flags for any group.

Format:

```
>FLA[GS] [[ggg]/keyword]
```

[ggg]

Represents the group for which the group global event flags are to be created; defaults to login UIC group.

Keywords:

/CRE

Creates group global event flags for the specified UIC group. If the flags already exist but are marked for delete, the delete flag is cleared.

/ELIM

Eliminates group global event flags for the specified UIC group. Event flags are not eliminated until the access count reaches 0. If the access count is greater than 0, the flags are marked for delete.

When you omit the group number and keyword specification, the command displays all the group global event flags in the form:

```
ggg     access count     event flags     [DEL]
```

where [DEL] indicates group global event flags marked for delete.

Examples:

```
>FLA 303/CRE
```

Creates group global event flags for all tasks running under the UIC group number 303. All flags are initialized to 0 when created.

FLA (Cont.)

```
>FLA
303     1     000010 000000
```

Displays the access count (1) and event flags set (in this case, flag 68) for the UIC group 303. The access count is the number of tasks using the event flags.

The group global event flags are represented by two octal words. The first word contains event flags 65 through 80 (from right to left) and the second word contains event flags 81 through 96 (from right to left).

```
>FLA 303/ELIM
```

Eliminates group global event flags for UIC group 303.

Command Error Message:

FLA -- ILLEGAL FUNCTION

The /CRE keyword was specified, but the event flags already existed (even though they may have been marked for delete), or the /ELIM keyword was specified, but the event flags were already eliminated or marked for delete.

HELLO/LOG

HELLO or LOGIN (NP)

The HELLO and LOGIN commands log you in on a terminal to gain access to a multiuser protection system. Before you log in, the system rejects all MCR commands except HELLO, LOGIN, and HELP. Parameters to the HELLO command are a last name or User Identification Code (UIC) and a password. The system validates these parameters according to entries in an account file.

If the name or UIC and password match an entry in the account file, the system performs the following actions:

1. Checks to see if the terminal's current command line interpreter (CLI) has requested a silent login. (Silent logins are available only on systems with multi-CLI support.) If so, HELLO does not display the login text file or the user's login command file, does not execute the system login command file, and does not set the default CLI for the terminal.

2. Assigns the login logical device name SY0: to the user's system disk unless the user's logical system device is already the same as physical device SY:. (The system disk is the one that contains the user's files.)

3. Establishes the user's login UIC, which is the initial default UIC.

4. Records the current time and date and other information about the terminal session in the system file.

5. **On an RSX-11M-PLUS system that has CPU accounting active, sets up accounting data structures.**

6. Displays a system identification, the current date, and the time the user logged in on the terminal. If the CLI requests silent login, the information is not displayed.

7. If the system supports alternate CLIs, sets the terminal's default CLI to be the one specified in the user's account file.

8. Displays the contents of the file LB:[1,2]LOGIN.TXT. If the CLI requests a silent login, LOGIN.TXT is not displayed.

   On RSX-11M-PLUS, if a batch job is being run from the terminal, HELLO displays LB:[1,2]BATCH.TXT. However, if BATCH.TXT does not exist, HELLO displays LOGIN.TXT. HELLO does not display any login text file on a virtual terminal unless a batch job is being run from it.

9. Executes the system command file LB:[1,2]SYSLOGIN.CMD (if it exists) unless the CLI requests a silent login. Before the file is invoked, HELLO instructs the system to override the user's default CLI and use MCR to process the file. (This allows SYSLOGIN.CMD to use MCR commands.) SYSLOGIN.CMD is invoked with the terminal privileged and slaved.

HEL/LOG (Cont.)

HELLO passes the following information to SYSLOGIN.CMD:

Default system device	(xxn:)
Login UIC	([g,m])
Last name	
First initial	
If terminal is to be privileged	(P or NP)
If terminal is to be slaved	(S or NS)

On RSX-11M-PLUS systems, HELLO also passes the following information:

If terminal is TT, VT, or batch VT	**(T, V, or B)**
Account number	
Session ID	

If SYSLOGIN.CMD exists, it must do the following:

- Check the appropriate parameter to see if the terminal should be privileged or nonprivileged and set the terminal accordingly and then check the appropriate parameter to see if the terminal should be slaved or nonslaved and set the terminal accordingly.

  NOTE

  It is important to set a terminal's privilege status before its slave status. Otherwise, a nonprivileged user could become privileged.

- If your system has multi-CLI support, issue the command CLI /UNOVR to instruct the system to use the user's CLI. The CLI would be MCR, DCL, or a user-written CLI.

  If a default CLI is not specified in the account file, the terminal is set to MCR. If the specified CLI is not present in the system, HELLO issues an error message and the user cannot log in.

The following code is an example of a system command file (using Indirect):

```
        .ENABLE SUBSTITUTION
        .ENABLE QUIET
        .IF P5 = "P" .GOTO SLAV
        SET /NOPRIV=TI:
.SLAV:  .IF P6 = "S" .GOTO OVER
        SET /NOSLAVE=TI:
.;
.;CLEAR OVERRIDE BIT
.;
OVER:   CLI /UNOVR
        .DISABLE QUIET
        .SETS FILE P1+P2+"LOGIN.CMD"
        .TESTFILE 'FILE'
        .IF <FILERR> = 1 .CHAIN 'FILE'/LO
.END:
```

HEL/LOG (Cont.)

10. If LB:[1,2]SYSLOGIN.CMD does not exist, HELLO executes the user's LOGIN.CMD if it exists. Before executing, HELLO sets the user's slaved or nonslaved and privileged or nonprivileged status and clears the CLI override bit.

11. After invoking HELLO, if the user does not enter a name or UIC and password, HELLO prompts for them. If the user does not respond to the prompt within a certain time interval, HELLO times out. The timeout interval is specified when the HELLO task is built. If the interval is zero (0), HELLO does not time out.

If logins have been disabled for your system, HELLO displays the reason for this. It desired, the person who disables logins can create or edit LB:[1,2]NOLOGIN.TXT to include the reason.

Formats:

In the following command formats, the braces indicate that the user enters one of the two parameters.

- >HEL[LO] {uic / username} /password RET

- >HEL[LO] RET
  Account or name: {uic / username} RET
  Password: password RET

- >HEL[LO] {uic / username} RET
  Password: password RET

uic

Your User Identification Code (UIC). The command allows the following four UIC representations:

```
g,m
[g,m]
g/m
[g/m]
```

To suppress part of the display of the file LOGIN.TXT, use the slash form (that is, g/m or [g/m]).

The variables g and m are octal numbers from 1 through 377 that represent group and member numbers, respectively.

username

Your last name, which can be entered in place of a UIC.

password

An alphanumeric password. If you type the password in response to the prompt PASSWORD:, the system does not display (echo) the typed characters.

HEL/LOG (Cont.)

If the HELLO command was successful, the system displays the following message:

```
system i.d.
dd-mm-yy hh:mm Logged on Terminal TTnn:   as    xxxnnnn

greeting

[login-text]
```

system i.d.

One of the following, depending on the system:

```
RSX-11M BLnn  [g,m] System     nodename

RSX-11M-PLUS V02 BLnn  [g,m] System     nodename
```

dd-mm-yy

The current date.

hh:mm

The time the user logged in.

xxxnnnn

An RSX-11M-PLUS session identifier assigned to this terminal session.

greeting

One of the following, depending on the time of day:

```
Good Morning
Good Afternoon
Good Evening
```

login-text

The contents of LOGIN.TXT (or BATCH.TXT). The system displays the contents of the file as follows:

- If you use the slash form when specifying the UIC the first time you log in, the display concludes at the first percent sign (%) in the file. Subsequent logins on any one day (using the slash form) do not display the contents of the text file unless the file has been edited. (The percent sign is used to separate new messages from old ones.)

- If you do not use the slash form, the system displays the entire file. (Note that you can type CTRL/O to end the display after the first percent sign.)

If the login text file does not exist, the message

```
MESSAGE FILE ERROR -26
```

is displayed.

HEL/LOG (Cont.)

Examples:

RSX-11M systems

```
>HEL
Account or name:  AMBER
Password:

RSX-11M BL32     [4,54] System      QUASAR
2-FEB-81 10:03 Logged on Terminal TT20:

Good Morning

2-FEB-81

        *** NEW DISK CONFIGURATION ***
        DB0:    System and User disk

>

       (User typed CTRL/O to stop output.)


>HEL [301/365] /BOB

RSX-11M BL32     [4,54] System
2-FEB-81 10:06 Logged on Terminal TT20:

Good Morning


>HEL 301/365
PASSWORD:

RSX-11M BL32     [4,54] System
3-FEB-81 09:45 Logged on Terminal TT17:

Good Morning

>


>HEL 301,365 /BOB

RSX-11M BL32     [4,54] System
3-FEB-81 09:45 Logged on Terminal TT17:

Good Morning

2-FEB-81

        *** NEW DISK CONFIGURATION ***

>

       (User typed CTRL/O to stop output.)
```

HEL/LOG (Cont.)

RSX-11M-PLUS systems

```
>HEL 303/24/79584

RSX-11M-PLUS V02 BL10                [2,54] System      CASTOR
02-FEB-81 17:58 Logged on Terminal TT30: as WRT17

Good Afternoon

>

>HEL 303,24
PASSWORD:

RSX-11M-PLUS V02 BL10                [2,54] System      CASTOR
02-FEB-81 18:01 Logged on Terminal TT30: as WRT17

Good Evening

30-JAN-81

   Batch

      (User typed CTRL/O to stop output.)

>
```

Command Error Messages:

Note that if you use the LOGIN command to log in instead of HELLO, the error messages are preceded by LOG.

HEL -- ACCOUNT FILE OPEN FAILURE

The account file was open for another user or the disk containing the account file was not mounted. Reenter the command line.

HEL -- ACCOUNT FILE RECORD(S) LOCKED

(RSX-11M-PLUS systems only.) HELLO could not access an account record. Reenter the command line.

HEL -- ASSIGN FAILURE

HELLO could not assign your system device.

HEL -- CANNOT ALLOCATE UAB

(RSX-11M-PLUS systems only.) The Resource Accounting system requires space in secondary pool to allocate a User Account Block (UAB). If sufficient space is not available in secondary pool, nonprivileged users cannot log in. (The Resource Accounting system accepts a switch, /POOL RESERVE, that permits the system manager to alter the secondary pool limit. See the RSX-11M/M-PLUS System Management Guide for complete details.)

HEL/LOG (Cont.)

HEL -- CANNOT FIND PHYSICAL LB:

HELLO could not open the file because LB: was not assigned.

HEL -- CANNOT SET CLI

(Multi-CLI systems only.) The command line interpreter (CLI) is installed in the system, but HELLO failed to set the terminal to the CLI.

HEL -- CLI NOT IN SYSTEM

(Multi-CLI systems only.) You could not log in because the default CLI specified for you in the account file is not installed in the system.

HEL -- INVALID ACCOUNT

The name or UIC specified in the command is not stored in the account file or the password specified does not match the name or UIC given.

HEL -- LOGINS ARE DISABLED

The system was in the process of shutting down or the command SET /NOLOGON has been issued. You cannot log in at these times.

HEL -- LOW POOL - NONPRIVILEGED LOGINS DISABLED

To save space in pool, the system will not allow nonprivileged users to log in.

HEL -- MESSAGE FILE ERROR nnn.

The system could not open the file LOGIN.TXT for a reason indicated by the FCS code nnn. See the IAS/RSX-11 I/O Operations Reference Manual for a definition of the FCS code.

HEL -- OTHER USER LOGGED ON

Another user was currently logged in on the issuing terminal. Only one user at a time can be logged in on a terminal.

HEL -- PRIVILEGED USER LOGGED WITHOUT UAB

(RSX-11M-PLUS systems only.) This message indicates that there was not sufficient space in secondary pool for the Resource Accounting system to allocate a User Account Block (UAB). However, the system permits privileged users to log in, although the accounting system will not keep track of their use of the operating system. See the RSX-11M/M-PLUS System Management Guide.

HEL/LOG (Cont.)

HEL -- SPAWN FAILURE

The Executive directive SPAWN failed to assign your system device or the Executive directive RPOI failed to chain to Indirect to execute the login command file.

HEL -- SYNTAX ERROR

The format of the command line for HELLO was incorrect.

HEL -- TERMINAL ALLOCATED TO OTHER USER

The issuing terminal was already allocated to another user. You cannot log in on a terminal allocated to someone else.

HEL -- TIMEOUT ON RESPONSE

You did not respond to the HELLO prompt before the timeout count elapsed. (The timeout count is specified when the HELLO task is built.)

HEL -- WARNING ** DEFAULT DEVICE NOT IN SYSTEM

Your default system device is not in the system, so HELLO did not make the assignment. However, you are still logged in.

HELP

HELP (NP)

The HELP command displays the contents of the general help file for your system. The default help file is LB:[1,2]MCR.HLP. HELP is the only MCR command that you can issue without logging in. The display usually contains information on how to log in on the terminal, but each installation can change the contents of its help file to suit specific needs.

Formats:

HELP % [qualifier1] [qualifier2] [...qualifier9]

HELP[/keyword] [qualifier1] [qualifier2] [...qualifier9]

%

Displays the text contained in [current-uic]HELP.HLP. You must be logged in to request HELP %.

Keywords (all mutually exclusive):

/CLI:cliname

Directs HELP to the help file or a command line interpreter (CLI) in LB:[1,2]cliname.HLP.

If you are in your own CLI and omit the keyword, the default help file is LB:[1,2]MCR.HLP.

/DCL

Specifies that the help text begins in the file LB:[1,2]DCL.HLP. This is the default for terminals set to DCL.

/FIL:[filespec]

Specifies any file where help text is located. If you do not give a complete file specification, the defaults are LB:[1,2]filename.HLP. If you only use /FIL:, the default help file is LB:[1,2]MCR.HLP.

/GRO

Instructs HELP to use [group,1]HELP.HLP on the default volume as the root help file. Group help files allow users with the same group number to share common help files for that group.

/LOC

Displays the text contained in HELP.HLP in the default directory on the default volume. This keyword is equivalent to the HELP % command.

HELP (Cont.)

/MCR

Specifies that the help text begins in the file LB:[1,2]MCR.HLP. This is the default for terminals set to MCR.

/OUT:filespec

Saves the text of the help file (or files) in the specified file. If you do not specify a file, HELP puts the help text in a file named .;1. If you do not use the /OUT keyword, HELP displays the files on your terminal.

/xxx

Specifies that the help text begins in the file LB:[1,2]xxx.HLP, where xxx is the name of a CLI. This keyword produces the same results as specifying /CLI:xxx.

The format of a HELP.HLP file is:

```
1  FIRST-QUALIFIER-1
   Text that will be displayed if you type HELP
   FIRST-QUALIFIER-1.

2  FIRST-QUALIFIER-2
   Text that will be displayed if you type HELP FIRST-QUALIFIER-1
   FIRST-QUALIFIER-2.

2  SECOND-QUALIFIER-2
   Text that will be displayed if you type HELP FIRST-QUALIFIER-1
   SECOND-QUALIFIER-2.

1  SECOND-QUALIFIER-1
   Text that will be displayed if you type HELP
   SECOND-QUALIFIER-1.
```

The numerals are level numbers and range from one through nine inclusive. Level numbers must be the first character of their line and the qualifiers that follow must be uppercase. Arbitrary strings of blanks or tabs are allowed between level numbers and qualifiers. If a qualifier begins with a dollar sign ($) or a slash (/), the $ or / is ignored.

HELP interprets its command line in a strictly nested fashion. When searching for qualifiers in a help file, HELP begins by looking for a line containing level number 1, followed by the first qualifier specified in the command line. If successful and no other qualifiers were specified, the subsequent help text is displayed. Otherwise, the search continues for a line containing level number 2, followed by the second qualifier specified in the command line. Again, if no other qualifiers were specified, the subsequent help text is displayed. This correspondence of qualifier position in the HELP command line with level numbers in the help file continues until the last qualifier is found.

HELP (Cont.)

HELP permits references within the help file to other files that contain large blocks of text and/or additional level numbers and their qualifiers. Indirect references to other files decreases search time and also allows more flexible use of the help file. To reference another file from within the help file, specify an at sign (@) as the first nonblank character on a line followed by a file specification. For example:

```
@filespec
```

The variable filespec is any legal RSX-11M/M-PLUS file specification. The default file type is .HLP. However, if a file type other than .HLP is specified, HELP uses the specified file type as the default in succeeding indirect references. For example, if you specify @filename.TXT, HELP uses .TXT as the default file type in future indirect references. The file version number always defaults to the highest existing version.

The file referenced in this manner has the same format as the help file. Note that if the indirect file contains level numbers, the level numbers must be greater than the level number in the help file that precedes the call to the indirect file. For example, if the help file contains the following lines:

```
1 EXAMPLE
@HELPEXAMPLE
```

then HELPEXAMPLE.HLP can only contain level numbers greater than 1 (the numerals 2 through 9).

HELP also allows you to share text between two or more similar or synonomous qualifiers in the help file. To do this, specify a pound sign (#) followed by the similar qualifier as the first nonblank character on a line. For example, to relate the qualifiers LOGIN and HELLO, the help file would contain the following lines:

```
1 LOGIN
#HELLO
1 HELLO

   See Ben Smith for an account and password.
```

Note that the qualifier that contains the displayed text must be of the same level number as all the qualifiers that refer to it. Also, since HELP searches the help file sequentially, the qualifier must appear after all those that refer to it.

Along with one-word synonyms, you can also use string synonyms. For example:

```
1 UTILITIES
2 RUNNING
 = TASKS EXECUTING
1 TASKS
2 EXECUTING
```

Always begin the string synonym with qualifier 1.

HELP (Cont.)

Example:

The following is an example of a help file:

The general form of the HELP command is:

HELP [qualifier1] [qualifier2] [...qualifier9]

This displays text from the system help file.

The other general form of the HELP command is:

HELP % [qualifier1] [qualifier2] [...qualifier9]

This displays information from a user's own help file. This syntax is not legal until you are logged in.

```
1 LOGIN
 @HELLO
1 SPELLING

        Type HELP SPELLING DICTIONARY followed by the word
        you want to spell.
2 DICTIONARY

        The file DICTIONARY.HLP [not included in this
        example] contains an abridged listing of frequently
        misspelled words.

 @DICTIONARY
1 HELLO

        See Ben Johnson for an account and password.
1 CREATE
```

NOTE

When creating a help file, the first line should be blank since it is not displayed.

By convention, each line should begin with a blank or tab; the lines cannot begin with the digits 1 through 9 since these would be interpreted as level numbers. Also, depending upon the types of devices in your configuration, some practical restrictions should be imposed. For example, to accommodate VT05Bs, lines of text should not be more than 72(10) characters long and a block of text should not be more than 20(10) lines. If there are level n+1 qualifiers, they should be mentioned in the text so that they are known to exist. Similarly, level 1 qualifiers should be added to the text displayed when only HELP is typed.

HELP (Cont.)

If a system contained this help file, you would get the following display in response to HELP L:

```
>HELP L

            See Ben Johnson for an account and password.

>
```

The qualifier HELLO is the synonym defined for LOGIN (L), so HELP displays the text following HELLO for both qualifiers. (Note that a qualifier may be specified by the fewest initial characters that unambiguously define it.)

Command Error Messages:

HEL -- AMBIGUOUS HELP QUALIFIER

The qualifier does not specify a unique part of the help file. Further characters must be supplied. Examine the command line that HELP displayed below the error message and specify the last qualifier displayed more completely.

HEL -- AMBIGUOUS HELP SYNONYM

The qualifier referenced as a synonym was not unique.

HEL -- CANNOT INITIALIZE FILE STORAGE REGION CORRECTLY

The HELP text could not be buffered adequately. Reenter the command line.

HEL -- CANNOT OPEN OUTPUT FILE

The output file specified with the /OUT:filespec keyword cannot be created. This message can occur for several reasons. For example, the device may be write-locked or you do not have the necessary access privileges for the specified UFD.

HEL -- EXCESSIVELY NESTED OR RECURSIVE SYNONYMS

A string synonym used in the help file has probably been defined recursively.

HEL -- HELP FILE ERROR nnn

The help file could not be opened for the reason specified by the FCS code nnn. If the code number is -26, the help file does not exist. See the IAS/RSX-11 I/O Operations Reference Manual for definitions of the error codes.

HEL -- HELP SYNONYM NOT FOUND

The help file referenced a synonym, but the file did not include it.

HELP (Cont.)

HEL -- ILLEGAL SWITCH - NOT LOGGED IN

You attempted to reference a local or group help file or output help text to another file without being logged in. Log in on the system and then enter the HELP command line.

HEL -- IMPROPER HELP FILE FORMAT

The help file is not in proper format and cannot be used. Either edit the file or reenter it in proper format.

HEL -- INDIRECT HELP FILE OPEN ERROR

HELP attempted to reference another file from within the help file, but could not open the indirect file.

HEL -- INDIRECT HELP FILE SYNTAX ERROR

HELP encountered a syntax error either in a reference to another file or in the indirect file itself.

HEL -- SWITCH SYNTAX ERROR

You specified a keyword incorrectly. Reenter the command line.

HEL -- UNKNOWN HELP QUALIFIER

The help file does not contain the last qualifier displayed in the command line below the error message.

HOM

HOME (NP,P)

The HOME command allows you to modify certain fields in the home block of a Files-11 disk volume. After you make the changes, HOME performs extensive checks to ensure that a good home block is written back onto the volume. If any of these checks fail, HOME attempts to place an alternate home block on the first free block on the home block search path. If this is completed successfully, HOME issues a warning message about the new home block. However, you should copy the volume as soon as possible because the alternate home block could be destroyed while the volume is mounted.

To use the HOME command, you must first install the INI task with the task name ...HOM as follows:

```
>INS $INI/TASK=...HOM
```

The difference between INI and HOME is that INI writes the home block of a volume whereas HOME changes the information in the home block (without changing anything else). Because the HOME command and the INI command are implemented within the same task, they share many of the same error messages. See the description of the INI command for explanations of these common messages.

Also be aware that you cannot use the HOME command on RSX-11M V3.2 (or earlier versions) or on RSX-11M-PLUS V1.0 and get the desired results.

Format:

```
HOM[E] ddnn:volume-label/keyword(s)
```

ddnn:

The volume whose home block you want to modify.

On RSX-11M, the volume must be allocated and unmounted or allocated and mounted foreign.

On RSX-11M-PLUS, the volume must be allocated and mounted foreign.

volume-label

The current label for the volume.

/keyword(s)

The specifications for the fields you want to modify in the home block. Each keyword defaults to the value specified for the particular field when the volume was initialized. The keywords do not change the files created by the INI command.

Keywords:

/DENS=density

Checks the density of a floppy disk. If specified, the drive density is compared against the keyword value for consistency. Acceptable values are: HIGH and LOW.

HOM (Cont.)

/EXT=block-count

Specifies the default file-extend size. A file must be extended when it has used all of its allocated space. Legal values for block-count range from 1 through 255(10).

Note that if you specify /EXT=0. no files (including the system files) can be extended. Therefore, although there may be free space on the disk volume, unless there are also free file headers, new files cannot be created on the volume. (If there are no free headers and the index file cannot be extended, no new files can be created.)

/FPRO=[system,owner,group,world]

Specifies the default protection for the files on the volume. Access codes consist of four 4-code groups in the access rights word as follows:

R - Read
W - Write
E - Extend
D - Delete

In each instance, the absence of the code means that the user class is denied the access right.

The user classes (system, owner, group, world) are positional. That is, the location of the word in the string defines the user class to whom the code applies. The order is:

[system,owner,group,world]

The square brackets are required syntax.

Substitute an asterisk (*) for the access codes to force the default value for a specific class.

/LRU=directory-count

Specifies the approximate number of directories that will be accessed simultaneously. The F11ACP maintains a list of the most recently used directories. The value you specify for /LRU sets the number of entries in this list. In general, directory operations can be speeded up significantly by increasing the number of entries.

If a directory appears in the list, no disk I/O is required for finding the directory in the Master File Directory (MFD) In addition, directory operations do not require the directory file header to be read. If you do not use /LRU, the default for directory-count is the value specified when the volume was initialized.

Legal values for directory-count range from 1 through 127(10). Note that increasing the value for /LRU increases the number of File Control Blocks (FCBs) used and may increase the amount of system pool used. See the appropriate system generation manual for more information.

HOM (Cont.)

Also note that if you specify /LRU=0, the F11ACP will not keep a list of directories. This is not recommended and could have an adverse effect on system efficiency.

/MXF=file-count

Specifies the maximum number of files allowed on the volume. This number corresponds to the number of file headers in the volume's index file. The value for /MXF includes the five system files and cannot be greater than the total number of bits allocated to the index file bitmap. Use the following algorithm to determine the maximum number of files allowed on your volume:

maximum = (4096.)*(current-number-of-index-file-bitmap-blocks)

The number of index file bitmap blocks depends on the maximum number of files currently allowed on the volume. Use the /VI keyword to obtain this number and read the description of the /INF keyword for the INI command to determine how many index file bitmap blocks are on the volume.

Note that you also cannot reduce the maximum number of files already specified for the volume.

/NAME=new-volume-label

Specifies a new label for the volume.

/OVR (P)

Instructs the HOME command to override label processing so that a volume can be modified without specifying a volume label.

/OWNER=[group,member]

Specifies the owner of the volume. This keyword is identical to /UIC. Legal group and member numbers range from 1 through 377(8). The square brackets are required syntax.

/PRO=[system,owner,group,world]

Specifies the default protection for a volume. Access codes consist of four 4-code groups in the access rights word as follows:

R - Read
W - Write
C - Create
D - Delete

In each instance, the absence of the code means that the user class is denied the access right.

HOM (Cont.)

The user classes (system, owner, group, world) are positional. That is, the location of the word in the string defines the user class to whom the code applies. The order is:

[system,owner,group,world]

The square brackets are required syntax.

Substitute an asterisk (*) for the access codes to force the default value for a specific class.

/UIC=[group,member]

Specifies the owner of the volume. Legal group and member numbers range from 1 through 377(8). The square brackets are required syntax. This keyword is identical to the /OWNER keyword.

/VI

Lists the HOME keywords and their values for the specified volume.

/WIN=retrieval-pointer-count

Specifies the number of mapping pointers to be allocated for file windows. A file window consists of a number of mapping pointers and is stored in memory when the file is opened. (See the IAS/RSX-11 I/O Operations Reference Manual for a description of mapping pointers.) The retrieval-pointer-count must be 1 through 127(10).

Example:

```
>HOM DK0:TEST/MXF=2357./VI

** Volume information for DK0: **

Label   = TEST
/Cha    = []
/Ext    = 100.
/Fpro   = [RWED,RWED,RWED,R]
/Lru    = 3.
/Mxf    = 2357.
/Pro    = [RWED,RWED,RWED,RWED]
/Uic    = [1,1]
/Win    = 7.

Maximum possible files = 4096.

The Homeblock revision count is 1, Last revised on 11-AUG-81
Volume created on 11-AUG-81 at 19:47:37
```

HOM (Cont.)

Command Error Messages:

NOTE

If you receive an error message that is not listed here, see the description of the INI command for an explanation of the message.

<bell>*** ATTENTION ***<bell>
THIS VOLUME IS OPERATING WITH A REPLACEMENT HOME BLOCK
PLEASE TAKE THE ACTION OUTLINED IN THE DOCUMENTATION

HOME could not ensure that a good home block would be written back to the volume, so it has placed an alternate home block on the first free block on the home block search path. The new home block is not allocated to or mapped by any file. You should copy the volume as soon as possible because many operations on a mounted volume could destroy the replacement home block.

HOM -- FAILED TO FIND HOME BLOCK

HOME could not locate the home block of the volume.

HOM -- FAILED TO PLACE ALTERNATE HOME BLOCK

When HOME cannot ensure that a good home block will be written back to the volume, it attempts to place an alternate home block on the first free block of the home block search path. This message indicates that the attempt failed. Note that your volume may be corrupted and therefore unmountable.

HOM -- MXF LESS THAN OR EQUAL TO THE EXISTING VALUE

The value specified with /MXF was less than or equal to the maximum number of files already specified for the volume. This value must be greater than the current number of files allowed.

HOM -- SWITCH IS NOT LEGAL IN THIS MODE

You attempted to use INITIALIZE keywords and/or their options with the HOME command.

HOM -- WRONG VOLUME LABEL

The volume label specified in the command line did not match the volume's current label.

INI

INITVOLUME (NP)

The INITIALIZE VOLUME command produces a Files-11 volume (see Section 2.1). On disk and DECtape, the command initializes the volume (destroys all existing files), writes a dummy bootstrap and a home block, and builds the directory structures. On magnetic tape, the command writes a volume label according to the ANSI X3.27-1978 standard and writes a dummy file that destroys all existing files.

Note that a magnetic tape volume produced by the INI command is considered to be a null volume. If you are going to transport a newly initialized tape to a non-RSX-11M/11M-PLUS system, you might first have to make the null volume comply fully with the ANSI standard. To produce an ANSI-standard volume, you must write an actual file or a null file on the tape. You can use the following command line to do this:

```
PIP>ddnn:DUMMY=NL:
```

(Also note that the null device NL:, is a system generation option on RSX-11M.)

On multiuser protection systems, you can initialize a volume only on allocated, private devices (that is, a device you have allocated). On RSX-11M systems that do not support multiuser protection, a user must be privileged to initialize a volume.

On RSX-11M, the volume must be unmounted or mounted foreign.

On RSX-11M-PLUS, the volume must be mounted foreign.

Selecting appropriate values for the command parameters requires an in-depth knowledge of Files-11. Refer to the IAS/RSX-11 I/O Operations Reference Manual for details of the Files-11 disk and ANSI magnetic tape structures.

Format:

```
INI[TVOLUME] ddnn:["]volume-label["][/keyword(s)]
```

Note that you can use a hyphen (-) as the last character on a line to extend the INI command line when selected keywords cause it to exceed 80 characters (or whatever buffer size has been specified for the terminal). You can use any number of continuation lines, but the total command line cannot exceed 512(10) characters.

On RSX-11M, you must first invoke INI and then begin using continuation lines when INI prompts you (INI>).

On RSX-11M-PLUS, you can begin using continuation lines on the same line in which you invoke INI.

ddnn:

The device unit name and number of the volume to be initialized.

INI (Cont.)

["]volume-label["]

The volume label. This may be up to 12(10) characters in length for disk and DECtape, and up to 6 characters for magnetic tapes. The label identifies the volume and must be specified.

For magnetic tapes, the volume label is usually a reel number that uniquely identifies the tape. The number is assigned by the installation and, according to the ANSI standard, cannot be duplicated within an installation.

When you specify a volume label for the magnetic tape, you can use the following characters: the uppercase letters A through Z, the digits 0 through 9, and the following special characters:

<space> ! " % & ' ( ) * + , - . / : < = > ? ;

To use a label that contains a special character, enclose the label in quotation marks ("label"). To use a quotation mark in a label, you must use two quotation marks within the quoted string. For example, the label T"1% has to be specified in the command line as "T""1%". Any lowercase letters specified in a volume label are converted to uppercase before any operations are performed on the volume.

/keyword(s)

The specifications for various characteristics you want the volume to have upon initialization.

Keywords:

/ACCESS="character"

Allows the owner of a magnetic tape volume to specify the access protection for the volume. INI places "character" in VOL1 (the accessibility field), which is usually blank. Legal values for "character" are the uppercase letters A through Z, the digits 0 through 9, and the following special characters:

<space> ! " % & ' ( ) * + , - . / : < = > ? ;

The default value for "character" is a space.

Note that if any nonblank character is specified, only a privileged user will be able to mount the volume.

/BAD=[option]

Indicates that bad-block processing is to be included in the volume initialization. Consequently, bad blocks on the volume will be marked as in-use and cannot be allocated to files.

INI (Cont.)

The brackets surrounding each option are required syntax. The options are:

[MAN]	Accept a bad block list specified from the terminal.
[AUTO]	Read the bad-block descriptor file on the last track of the volume created by the manufacturer's diagnostic routines or the Bad Block Locator Utility (BAD).
[NOAUTO]	Ignore the bad-block descriptor file and perform no bad-block processing.
[AUTO,MAN]	Read the bad-block file and, when done, accept blocks specified from the terminal.
[OVR]	Include the last track in the BADBLK.SYS file. This option assumes that the bad block file is located on the last good block before the last track. The option is only valid for devices that contain manufacturer-recorded bad block data in the last tracks (that is, DL:-, DM:-, and DR:-type devices).
[OVR,MAN]	Override the manufacturer's bad-block descriptor file and accept blocks specified from the terminal.

If the command line specifies [MAN], INI prompts for bad blocks as follows:

```
INI>LBN(S)=
```

Bad blocks can then be entered in the format:

```
blocknum:number
```

where blocknum specifies the bad block number and number specifies the number of sequential bad blocks beginning at blocknum.

INI requires the colon when you specify a sequence of bad blocks. Both blocknum and number default to decimal unless preceded by a pound sign (#).

To specify a single block, simply enter the block number and omit the colon.

To specify a sequence of bad blocks, separate each series of blocks with a space, tab, or comma. For example, the command line:

```
INI>LBN(S)=100:2,3,200:100,45:1
```

enters blocks 100, 101, 3, 200 through 299, and 45 as bad blocks.

A null line (pressing the RETURN key in response to the prompt) displays the bad blocks. The first number in the display represents the beginning block of the sequence; the second number is the number of bad blocks in the sequence. (Note that the numbers are decimal.)

To terminate bad block input, type CTRL/Z or press the ESCAPE key.

The default option is /BAD=[AUTO]. INI obtains the bad block information from the manufacturer-recorded bad-block descriptor file located on the last track of an RK06/07, RL01/02, or RM02/03/05/80/RP07 disk. INI also searches the last track for a bad-block descriptor file created by the BAD utility.

/DENS=density

Sets the bit density (bits per inch or bpi) of a magnetic tape loaded on a TE16, TU16, TU45, TS11, TSV05, TU80, TU77, or TU78 tape drive. Legal keyword values are:

/DENS=800

/DENS=1600

/DENS=6250

/DENS=HIGH

/DENS=LOW

Defaults:

/DENS=6250 for TU78 volumes
/DENS=1600 for TS11/TSV05/TU80 volumes
/DENS=800 for all others.

The /DENS keyword checks the density of a floppy disk in an RX02 drive or of a tape on a TS11/TSV05/TU80 drive. If a /DENS value is specified, the drive density is compared to the keyword value for consistency. If a /DENS value is not specified, no consistency check is performed and the volume is initialized at its current density.

/EXT=block-count

Specifies the number of blocks by which a file is to be extended when the file has used all of its allotted space. Legal values for block-count range from 1 through 255(10).

Default: /EXT=5. Note that if you specify /EXT=0, no files (including the system files) can be extended. Therefore, although there may be free space on the disk volume, unless there are also free file headers, new files cannot be created on the volume. (If there are no free headers and the index file cannot be extended, no new files can be created.)

INI (Cont.)

/FPRO=[system,owner,group,world]

Specifies the default protection for files created on the volume being initialized. Access codes consist of four 4-code groups in the access rights word as follows:

R - Read
W - Write
E - Extend
D - Delete

In each instance, the absence of the code means that the user class is denied the access right.

The user classes (system, owner, group, world) are positional. That in, the location of the word in the string defines the user class to whom the code applies. The order is:

[system, owner, group, world]

The square brackets are required syntax.

Substitute an asterisk (*) for the access codes to force the default value for a specific class.

Default file protection: /FPRO=[RWED,RWED,RWED,R].

/INDX=index-file-position

Specifies the logical block number for the index file. The keyword can be used to force the index file, the Master File Directory (MFD), and the storage allocation file to a specific volume location, usually to minimize access time. Four possibilities are available:

BEG - Place the index file at the beginning of the volume.

MID - Place the index file at the middle of the volume.

END - Place the index file at the end of the volume.

BLK:nnn - Place the index file at the specified block number.

Defaults: /INDX=MID (disk devices), /INDX=BEG (DECtape, DECtape II, and ML11).

/INF=initial-index-file-size

Specifies the number of file headers to allocate initially in the index file. The five system files (INDEXF.SYS, BITMAP.SYS, BADBLK.SYS, CORIMG.SYS, and 000000.DIR) are not included in the value for /INF.

INI (Cont.)

Defaults

DECtape	16
DECtape II	16
RA60	12308
RA80	7314
RA81	51699
RC25/RCF25	1565
RD51	602
RF11	16
RK05	147
RK06	834
RK07	1654
RL01	314
RL02	629
RM02/RM03	4049
RM05	25593
RM80	7461
RP02	1230
RP03	2460
RP04/RP05	5283
RP06	10478
RP07	51699
RS03/RS04	16
RX01/RX02	16
RX50	16
ML11	varies with disk size

The maximum number of file headers that can be allocated to a volume is either determined by the value specified with the /MXF keyword or is defaulted. The default number is based on the size of the volume (see the description of /MXF for the calculation). The maximum number of file headers determines if the volume will have a 1-, 2-, or 3-header index file.

You need to determine the maximum number of file headers allowed on the volume before you can calculate the number of headers that will be preallocated initially. The number of preallocated file headers is determined by either the value you specify with /INF or a formula that uses the value you specify with /MXF. The following list gives the three general formulas (one for each type of index file):

1-header index file

headers = maximum/2

headers — The initial number of preallocated file headers.

maximum — The maximum number of files (specified with /MXF).

If headers is less than 100(10), INI preallocates 16(10) file headers for your volume.

2-header index file

headers = maximum/2 or 25593(10), whichever is larger

INI (Cont.)

3-header index file

headers = maximum/2 or 51699(10), whichever is larger

See the description of the /MXF keyword for more information on multiheader index files.

/LRU=directory-count

Specifies the approximate number of directories that will be accessed simultaneously. The F11ACP maintains a list of the most recently used directories. The value specified for /LRU sets the number of entries in this list. In general, directory operations can be speeded up significantly by increasing the number of entries.

If a directory appears in the list, no disk I/O is required for finding the directory in the Master File Directory (MFD). In addition, directory operations do not require the directory file header to be read.

Legal values for directory-count range from 1 through 127(10). Note that increasing the value for /LRU increases the number of File Control Blocks (FCBs) used and may increase the amount of system pool used. See the appropriate system generation manual for more information.

Also note that if you specify /LRU=0, the F11ACP will not keep a list of directories. This is not recommended and could have an adverse effect on system efficiency.

Default: /LRU=3

/MXF=file-count

Specifies the maximum number of files allowed on the disk volume. This number corresponds to the number of file headers in the volume's index file (see the description of the /INF keyword). The value for /MXF includes the five system files and must be less than or equal to the number specified for the device in Table 3-2. In general, for a disk of size N, the default number of files is calculated as follows:

default-MXF = (((N-((N+4095.)/4096.)+9.)*127.)/258.)

The value also decides if the volume will be a Files-11 level 401 or 402 volume. Level 402 volumes will have a multiheader index file and allow up to 65,500 files on them. INI creates the multiheader index file and modifies the volume's home block automatically if the value specified is greater than 25,593. (If 65K index file support is not specified for the INI task, the largest value allowed for /MXF is 25,593. With 65K support, the largest value is 65,500.) Note that such volumes are not backwards compatible from RSX-11M V4.0 or from RSX-11M-PLUS V2.0. INI issues a warning message about the incompatibility when it creates a structure level 402 volume.

Table 3-2
Number of Files Allowed on Volumes

Device	Theoretical Maximum Value	Default Value	Maximum Number of Index Headers	Default Number of Index Headers
DECtape	278	34	1	1
DECtape II	247	30	1	1
RA60 disk	65500	24617	3	1
RA80 disk	65500	14629	3	1
RA81 disk	65500	54815	3	3
RC25/RCF25 disks	25045	3130	1	1
RD51 disk	9633	1204	1	1
RF11 disk	499	62	1	1
RK05 disk	2357	294	1	1
RK06 disk	13344	1668	1	1
RK07 disk	26466	3308	2	1
RL01 disk	5034	629	1	1
RL02 disk	10074	1259	1	1
RM02/RM03 disks	64798	8099	3	1
RM05 disk[1]	65500	30781	3	2
RM80 disk	65500	14923	3	1
RP02 disk	19680	2460	1	1
RP03 disk	39365	4920	2	1
RP04/RP05 disks	65500	10567	3	1
RP06 disk	65500	20956	3	1
RP07 disk[1]	65500	62007	3	3
RS03 disk	499	62	1	1
RS04 disk	1003	125	1	1
RX01 disk	238	29	1	1
RX02 disk	481	60	1	1
RX50 disk	388	48	1	1
ML11 disk	varies with size of disk			

1. Not backwards compatible by default.

NOTE

A Files-11 volume requires five files -- INDEXF.SYS, BITMAP.SYS, BADBLK.SYS, CORIMG.SYS, and 000000.DIR -- to create the disk structure (see the IAS/RSX-11 I/O Operations Reference Manual). Thus, the /MXF value must be computed by the maximum number of user UFDs and files plus the five files required for the Files-11 structure.

/OWNER=[g,m] (disks, DECtapes, and magnetic tapes)
/OWNER="owner" (magnetic tapes only)

Specifies the owner of the volume. It is similar to /UIC, but for magnetic tapes allows you to use a syntax other than [g,m]. /OWNER="owner" allows you to change the entire "owner identifier" field in the volume label block if this is necessary for interchange with other systems.

INI (Cont.)

/PRO=[system,owner,group,world]

Specifies the default protection for a volume. Access codes consist of four 4-code groups in the access rights word, as follows:

R - Read
W - Write
C - Create
D - Delete

In each instance, the absence of the code means that the user class is denied the access right.

The user classes (system, owner, group, world) are positional. That is, the location of the word in the string defines the user class to whom the code applies. The order is:

[system, owner, group, world]

The square brackets are required syntax.

Substitute an asterisk (*) for the access codes to force the default value for a specific class.

Default volume protection: /PRO=[RWED,RWED,RWED,RWED].

/UIC=[group,member]

Specifies the owner of the volume. Legal group and member numbers range from 1 through 377(8). The square brackets are required syntax.

Default: /UIC=[1,1]

/VI

Lists all of the INI keywords and their values for the specified volume.

/WIN=retrieval-pointer-count

Specifies the number of mapping pointers to be allocated for file windows. A file window consists of a number of mapping pointers and is stored in memory when the file is opened. (See the IAS/RSX-11 I/O Operations Reference Manual for a description of mapping pointers.) The retrieval-pointer-count must be 1 through 127(10).

Default: /WIN=7.

INI (Cont.)

Examples:

```
>INI DK1:ICTSVOL2/UIC=[2,5]/INDX=BEG/FPRO=[RWED,RWE,RW,R]
```

The INITVOLUME parameters used in the example are:

DK1:	Device unit
ICTSVOL2	Volume label
/UIC	User Identification Code of the volume owner: group=2, member=5
/INDX=BEG	Index file location, forced to beginning of volume
/FPRO	Default file protection, specified by class as:

```
system:  Read,Write,Extend,Delete
owner:   Read,Write,Extend
group:   Read,Write
world:   Read-only
```

```
>INI DK0:TEST/EXT=100./VI

** Volume information for DK0: **

Label   = TEST
/Bad    = [Auto]
/Cha    = []
/Ext    = 100.
/Fpro   = [RWED,RWED,RWED,R]
/Indx   = Mid
/Inf    = 147.
/Lru    = 3.
/Mxf    = 294.
/Pro    = [RWED,RWED,RWED,RWED]
/Uic    = [1,1]
/Win    = 7.

Theoretical maximum files = 2357.
```

Command Error Messages:

INI -- ALLOCATION FOR SYS FILE EXCEEDS VOLUME LIMIT

The system was unable to allocate a system file from the specified block because of intermediate bad blocks or end-of-volume.

INI -- BAD BLOCK FILE CORRUPT - DATA IGNORED

Although automatic bad block recognition was selected, the bad block data on the disk was not in the correct format and was therefore ignored.

INI (Cont.)

INI -- BAD BLOCK FILE FULL

The disk had more than 102(10) bad regions on it.

INI -- BAD BLOCK HEADER I/O ERROR

An error was detected in writing the bad-block file header.

INI -- BLOCK(S) EXCEED VOLUME LIMIT

The specified block (or blocks) exceeded the physical size of the volume.

INI -- BOOT BLOCK WRITE ERROR

An error was detected in writing the volume boot block.

INI -- CHECKPOINT FILE HEADER I/O ERROR

An error was detected in writing the checkpoint file header.

INI -- COMMAND I/O ERROR

INI encountered an I/O error while reading the command line.

INI -- COMMAND TOO LONG

The command, including continuation lines, exceeded the maximum length of 512(10) characters.

INI -- DATA ERROR

The command specified a bad-block number or contiguous region that was too large.

INI -- DEVICE NOT ALLOCATED TO THIS TERMINAL - ddnn

The command line specified a private device that was allocated to a terminal other than the one from which the command was issued.

INI -- DEVICE NOT IN SYSTEM - ddnn

The command line specified a device not in the current system configuration.

INI -- DEVICE NOT MOUNTED FOREIGN

On RSX-11M-PLUS, a volume must be mounted foreign (MOUNT /FOR) before it can be initialized (or modified by HOME).

On RSX-11M, a volume can be unmounted or mounted foreign.

INI -- DEVICE NOT READY - ddnn

The command line specified a device that was not ready (not up to speed).

INI (Cont.)

INI -- DEVICE OFFLINE

The specified device is in the system but not presently on-line.

INI -- DEVICE WRITE LOCKED - ddnn

The command line specified a volume that was write-locked and therefore could not be initialized as a Files-11 volume.

INI -- DISK IS ALIGNMENT CARTRIDGE

The last track on an RK06/07, RL01/02, or RM02/03/05/80/RP07 identified the volume as an alignment cartridge, which cannot be initialized as a Files-11 volume. An alignment cartridge is specifically formatted for aligning disk read/write heads.

INI -- DRIVER NOT LOADED

The command line specified a device for which the driver has not been loaded.

INI -- DUPLICATE BLOCK(S) FOUND

INI attempted to define a block as bad that had already been defined as such.

INI -- FAILED TO ATTACH DEVICE - ddnn

INI could not attach the specified device.

INI -- FAILED TO READ BAD BLOCK FILE

The command was unable to read the bad block information from the last track of an RK06/07, RL01/02, or RM02/03/05/80/RP07 disk.

INI -- FAILED TO READ MANUFACTURER'S BAD SECTOR FILE

A disk read (hardware) error occurred when INI attempted to read the manufacturer-recorded bad block data on a last-track device. Reenter the command line and include the /BAD=OVR option.

INI -- FAILED TO READ SOFTWARE BAD SECTOR FILE

The software-detected bad sector file could not be read. Reenter the command line and include the /BAD=OVR option.

INI -- HOME BLOCK ALLOCATE WRITE ERROR

While INI was overwriting a bad home-block area, a write error occurred.

INI -- HOME BLOCK I/O ERROR

An error was detected in writing the volume home block.

INI (Cont.)

INI -- ILLEGAL ARGUMENT VALUE

This message can occur for one or more of the following reasons:

The value specified with /EXT was greater than 200(10).
The value specified with /INF was less than 16(10).
The value specified with /INF or /MXF was too large for the device type.
The value specified with /LRU was greater than 127(10).
The value specified with /WIN was greater than 127(10).

INI -- ILLEGAL KEYWORD VALUE

The value you specified with the keyword is illegal. Check the description of the keyword for the legal values.

INI -- ILLEGAL UIC

The UIC you specified with the /UIC keyword is not a valid one or is in an incorrect format. Legal values for UICs are 1 through 377(8) and are in the format [g,m].

INI -- INDEX FILE BIT MAP I/O ERROR

An error was detected in writing the index-file bitmap.

INI -- INDEX FILE I/O ERROR

An error was detected in writing the index-file header.

INI -- I/O ERROR ON DEVICE ddnn:

A fatal hardware error occurred on the specified device.

INI -- I/O ERROR SIZING DEVICE - ddnn

The system encountered an I/O error while sizing an RF11 disk.

INI -- MAGTAPE LABEL MUST BE SPECIFIED

The command attempted to initialize a magnetic tape without specifying the required volume label.

INI -- MAGTAPE DEVICE ERROR - ddnn

While positioning the magnetic tape, the system encountered an I/O error.

INI -- MAGTAPE WRITE ERROR - ddnn

While writing to the magnetic tape, the system encountered an I/O error.

INI (Cont.)

INI -- MANUFACTURER'S BAD SECTOR FILE CORRUPT

The manufacturer-recorded bad block data on a last-track device is in an inconsistent format. Reenter the command line and include the /BAD=OVR option.

INI -- MFD FILE HEADER I/O ERROR

An error was detected in writing the Master File Directory (MFD) file header.

INI -- MFD WRITE ERROR

An error was detected in writing a block in the Master File Directory (MFD).

INI -- MUTUALLY EXCLUSIVE SWITCHES SPECIFIED

The keywords /ACCESS, /OWNER, and /UIC cannot be specified in the same command line.

INI -- NO BAD BLOCK DATA FOUND

Although automatic bad-block specification was selected, no bad-block file was found on the volume. This is only a warning; INI continues and initializes the volume.

INI -- NOT FILE STRUCTURED DEVICE

The system does not support Files-11 on the specified device.

INI -- NULL FILE HEADER I/O ERROR

An error was detected in writing null-file headers to the index file.

INI -- PREALLOCATED TOO MANY HEADERS FOR SINGLE HEADER INDEX FILES

The number you specified with the /INF keyword was greater than 25598(10); therefore, the volume would have to have a multiheader index file.

INI -- PREALLOCATION INSUFFICIENT TO FILL 1ST INDEX FILE HEADER

The number you specified with the /INF keyword was less than 25588(10).

INI -- PREALLOCATION INSUFFICIENT TO FILL 1ST AND 2ND INDEX FILE HEADERS

The number you specified with the /INF keyword was less than 51694(10).

INI (Cont.)

INI -- PRIVILEGE VIOLATION

This message can occur for the following reasons:

- Only privileged users can use the /OVR keyword. (This is an error message for the HOME command.)
- Only privileged users can initialize volumes in a nonmultiuser protection system.

INI -- PUBLIC DEVICE - ddnn

The command line specified a public device. Only private devices can be initialized.

INI -- STORAGE BITMAP FILE HEADER I/O ERROR

A fatal hardware error occurred while the storage bitmap file header was being initialized.

INI -- STORAGE BITMAP FILE I/O ERROR

An error was detected in writing the storage allocation file header.

INI -- SWITCH IS NOT LEGAL FOR THIS DEVICE TYPE

A keyword was specified that cannot be used with the specified device. Check the description of the keyword for the valid devices.

INI -- SWITCH IS NOT LEGAL IN THIS MODE

You attempted to use HOME keywords and/or their options with the INI command.

INI -- SYNTAX ERROR

This message can occur for the following reasons:

- The value specified with the /ACCESS keyword was more than one character long.
- The volume label for an ANSI magnetic tape contained an invalid character.
- Illegal syntax was used during the manual input of bad block numbers.

INI -- THIS PROGRAM MUST BE INVOKED AS AN MCR FUNCTION

The task must be installed with the task name ...HOM or ...INI.

INI (Cont.)

INI -- UNDEFINED DENSITY SELECTION

The command line specified an illegal density value.

INI -- UNIT DOES NOT SUPPORT 800 BPI

The command line specified 800 bpi for a drive that does not support 800 bpi.

INI -- UNIT DOES NOT SUPPORT 1600 BPI

The command line specified 1600 bpi for a drive that does not support 1600 bpi.

INI -- UNIT DOES NOT SUPPORT 6250 BPI

The command line specified 6250 bpi for a drive that does not support 6250 bpi.

INI -- UNIT DOES NOT SUPPORT HIGH/LOW DENSITY SELECTION

The command line specified HIGH or LOW density for a device for which the /DENS HIGH and LOW options are undefined.

INI -- UNIT DOES NOT SUPPORT DENSITY SWITCH

The command line specified multiple densities for a device that does not have multiple density capability.

INI -- UNIT IS NOT AT LOW DENSITY

The command line specified that a floppy disk in an RX02 drive be initialized at low density, but the floppy was formatted at high density.

INI -- UNIT IS NOT AT HIGH DENSITY

The command line specified that a floppy disk in an RX02 drive be initialized at high density, but the floppy was formatted at low density.

INI -- VALUE OF (INF + 5) EXCEEDS /MXF

The value specified with the /INF keyword plus 5 (for the five system files) is greater than the maximum number of files specified with /MXF.

INI -- VOLUME MOUNTED FILES-11

An attempt was made to initialize a mounted Files-11 volume. Mounted Files-11 volumes cannot be initialized.

INI -- VOLUME MOUNTED FOREIGN WITH ACP

(RSX-11M-PLUS systems only.) The command line specified a device that was mounted foreign, but with an ACP. To initialize a volume on RSX-11M-PLUS, you cannot include an ACP name when the volume is mounted as foreign.

INI (Cont.)

INI -- VOLUME NAME TOO LONG - (volume name)

The command line specified a volume label that exceeded 6 characters for magnetic tape devices or 12(10) characters for disk or DECtape devices.

INI -- WARNING -- BLOCK 0 IS BAD

Block 0 of the specified volume, the boot block, was bad. Therefore, a bootable image cannot be placed on this volume. This is only a warning; INI continues and initializes the volume.

INI -- WARNING -- THIS VOLUME IS NOT BACKWARDS COMPATIBLE

INI has created a structure level 402 volume because the value specified with the /MXF keyword was greater than 25,593. Level 402 volumes cannot be used on versions of RSX-11M previous to V4.0 or on RSX-11M-PLUS V1.0.

INS

INSTALL (P)

The INSTALL command makes a specified task known to the system. An installed task is dormant (not active) until the Executive receives a request for it to run. INSTALL accepts optional keywords that provide parameters that were not specified when the task was built or that override previously specified parameters.

When you install a task, the system creates a Task Control Block (TCB) for the task in a memory-resident table called the System Task Directory (STD). The task parameters contained in the TCB enable the system to run the task when requested to do so by an MCR command or a system directive. You cannot run a task until it has been installed (see Section 2.5). (Note that the RUN command has an option that automatically installs and removes a task before and after running it.)

A TCB contains both the address of the load-device Unit Control Block (UCB) and the Logical Block Number (LBN) of the task image file. Because task image files are contiguous, the Executive can load the task image in one transfer when an MCR command or system directive requests an installed task. (However, if the task is greater than 32K words, loading requires more than one transfer.)

When you install a task in a virgin system, the system stores the task image file's LBN in the task header. When the system is saved, the SAVE task places the file identification, rather than the file's LBN, in the TCB. Then when the system is rebooted, it opens the task file and stores the new current LBN of the task in the TCB. If a task has been deleted, the system cannot open the task file when the system is rebooted. The system then automatically removes the task's TCB from the STD.

A saved system does not retain the physical addresses of installed tasks. The Disk Save and Compress (DSC) and Backup and Restore (BRU) utilities can compress and copy a disk containing a saved system, thus moving the task files to different physical locations. However, because the TCB entries contain task file identifications rather than LBNs, the system can function normally when it is rebooted.

On RSX-11M systems, when you install a resident library, INSTALL loads it into a common partition.

On RSX-11M-PLUS systems, when you install a resident library, INSTALL makes an entry for the resident library in the Common Block Directory (CBD). The system loads the resident library when a task that uses it runs and removes the resident library when no task is attached to it.

Format:

```
INS[TALL] [$]filespec[/keyword(s)]
```

filespec

The file specification in the form:

```
ddnn:[g,m]filename.type;version
```

INS (Cont.)

The type defaults to TSK; standard defaults apply to the remaining fields.

$

When you specify $ in the command line, ddnn: defaults to LB:, and [g,m] defaults to the current system UIC (usually, [1,50] for an unmapped system and [1,54] for a mapped system).

On RSX-11M-PLUS systems, if you specify $ and the file cannot be found under the system UIC, INSTALL searches the library directory on device LB:. By convention, LIBUIC is [3,54].

Note that if LB: has been reassigned to another device and that device's system UIC contains privileged tasks built for another system, your system will crash.

Keywords:

/AFF=[CPx,UBy]

(RSX-11M-PLUS multiprocessor systems only.) Allows you to specify the specific resources (affinity) required for task execution. The square brackets are required syntax. Legal values for the processor specification (x) are A, B, C, and D. Legal values for UNIBUS run specifications (y) are E, F, H, J, K, L, M, N, P, R, S, and T.

When you specify the /AFF keyword, the installed task runs only on the processor to which the specified UBMs are connected.

/CKP=option

Specifies whether or not a task will be checkpointable. The options are YES and NO. If you specify /CKP=YES (the default for checkpointable tasks), checkpointing is allowed. If you specify /CKP=NO, checkpointing is disabled for the task.

The /CKP keyword overrides the /CP switch specified at task build.

On systems that support the dynamic allocation of checkpoint space, the task image file does not need to contain allocated checkpoint space. The presence of the /CKP=YES keyword instructs the system to allocate checkpoint space, when required, for the task from a checkpoint file. (See the ACS command for more information on allocating checkpoint space.)

On RSX-11M systems, if a task was built with the /XH switch, the /CKP keyword is disabled for the task.

INS (Cont.)

/CLI=option

Specifies that the task being installed is a command line interpreter (CLI). The options are YES and NO. You must install a CLI with the YES option before you can set a terminal to that CLI (SET /CLI) or work with the CLI by means of the CLI command.

/INC=size

(Mapped systems only.) Increments the address space allocated to a task that runs in a system-controlled partition. The variable size is the number of additional words of address space to allocate. The increment is usually expressed in octal, but may also be expressed in decimal by appending a period.

This keyword overrides the EXTTSK or PAR option used at task-build time. Tasks that specify the size of the partition in which they are running use this keyword to identify how much dynamic space they may allocate to symbol tables or buffers. Tasks such as MAC, TKB, PIP, VFY, and AT. (Indirect) use the space from the end of the task image to the end of their address space as dynamic memory. In effect, the /INC keyword defines the number of words in this dynamic region.

You cannot extend a task that uses memory-resident overlays. (See the RSX-11M/M-PLUS Task Builder Manual.)

Default: Either the size specified at task-build time or zero (0).

/IOP=option

Specifies that a privileged task can overmap the I/O page. The options are YES and NO. If you specify /IOP=YES, INSTALL assumes that the task will overmap the I/O page (APR 7) and, if the task is larger than 8K words, issues a warning message. If you specify /IOP=NO, INSTALL assumes that the task does not need to use the I/O page. No warning message is issued.

/IOP complements the Task Builder /IP switch. Specifying /IP informs INSTALL that the task is intentionally overmapping the I/O page.

Default: /IOP=YES.

/PAR=pname

Overrides the partition name specified at task-build time. In an unmapped system, the specified partition must have the same base address as the partition for which the task was built.

INS (Cont.)

On RSX-11M systems, if the partition specified for the task is a user-controlled partition, the size of the task is extended to the size of the partition. Consequently, if the task is built with checkpoint space allocated in the task image file and the partition is extended (thereby extending the size of the task when the task is reinstalled), the allocated checkpoint space may no longer be large enough to hold the task.

If the keyword specifies a nonexistent partition, the system issues a warning message and attempts to install the task in the GEN partition.

Default: TKB uses the name GEN. (See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for an explanation of multiuser system defaults.)

/PMD=option

Requests a Postmortem Dump if the task aborts. The two options are YES and NO. If you specify /PMD=YES, a Postmortem Dump occurs if the task aborts because of an SST error condition. If you specify /PMD=NO, no dump is requested at SST abort time.

To generate a dump, the Postmortem Dump task PMD... must be installed in the system. This keyword overrides the /PM switch specified at task-build time.

Default: Specified at task-build time.

/PRI=number

Specifies the priority for the task. The value range is 1 through 250(10), where 250 is the highest priority. The standard numbering conventions apply: octal by default, decimal if followed by a period.

Default: /PRI=50.

/PRO=[system,owner,group,world]

(RSX-11M-PLUS systems only.) Specifies the protection for an installed common region. Access codes consist of four 4-code groups in the access rights word of the common region as follows:

R - Read
W - Write
E - Extend
D - Delete

In each instance, the absence of the code means that the user class is denied the access right. The square brackets are required syntax.

Substitute an asterisk (*) for the access codes to force the default value for a specific class.

Default: /PRO=[RWED,RWED,RWED,RWED].

Note that you cannot specify protection options for a read-only common region or the read-only portion of a multiuser task.

/RON=option

(RSX-11M-PLUS systems only.) Specifies read/write access for a common region. The options are YES and NO. If you specify /RON=YES, the region is installed as read-only. If you specify /RON=NO, the region is installed with read/write access. This keyword overrides the effect of the /PRO keyword.

Default: /RON=NO; the region is installed with read/write access.

/ROPAR=parname

(RSX-11M-PLUS systems only.) Installs the read-only portion of a multiuser task into the specified read-only system partition (parname).

The partition you specify overrides the partition name supplied at task build. If the named partition does not exist, MCR issues a warning message and attempts to install the read-only portion of the task into the partition containing the read/write portion of the task.

/SEC=option

(RSX-11M-PLUS systems only.) Places in secondary pool the Task Control Block (TCB) for the task being installed. The keyword is legal only for tasks whose names are in the form ...xxx or xxx$$$. The options are YES and NO. If you specify /SEC=NO, the TCB for the task is placed in primary pool instead of secondary pool.

Default: The TCB is placed in secondary pool.

/SLV=option

Specifies slave status for the task. The options are YES and NO. If you specify /SLV=YES, data sent to the installed task is marked with the terminal number (TI:) of the task sending it. When the installed task receives the data, the system sets the task's TI: to that associated with the data. This keyword overrides the /SL switch specified at task build.

If you specify /SLV=NO, the TI: of the task does not change when the task receives data.

INS (Cont.)

Default: Specified at task build.

/SYNC=option

(RSX-11M-PLUS multiprocessor systems only.) Synchronizes task use of a common. The options are YES and NO. This keyword permits several tasks to share a common and use the common for synchronization. If you specify /SYNC=YES for two or more tasks, only one of the tasks can execute at one time. Note that if one of the tasks becomes blocked, the others compete to execute.

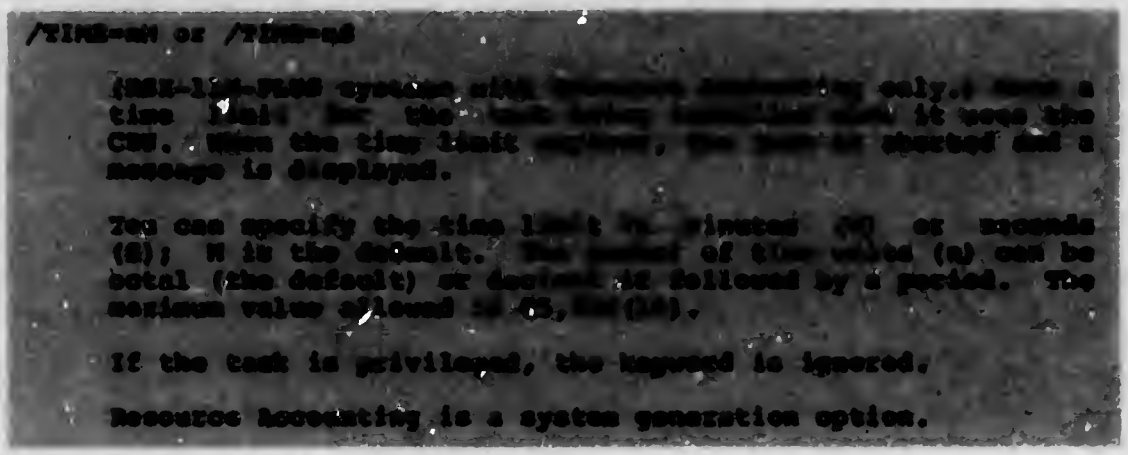
The /SYNC keyword prevents inconsistent data that occurs as the result of race conditions. For example, if two tasks access a common, the /SYNC keyword ensures that only one task executes at one time. This prevents the second task from reading or writing the common while the first task is executing.

Default: /SYNC=NO.

/TASK=taskname

Specifies the name by which the system refers to the task.

Default: The name specified at task-build time or the first 6 characters of the file name. (See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for an explanation of multiuser system defaults.)



/UIC=[group,member]

Specifies the UIC for the task. The square brackets are required syntax. You can also override the UIC with the RUN command.

The task UIC determines the file-protection class (system, owner, group, world) to which a task belongs and thus directly influences file access. Note that file protection may differ from file to file.

INS (Cont.)

Default: specified at task-build time. This default applies only to tasks started by a SPWN$, RPOI$, or RUN$ directive or a RUN command that specifies a time delay before ru time. Tasks started by typing the name as a command (fo. example, PIP and TKB) run under the default UIC of the terminal from which the command was issued.

INS (Cont.)

When you specify /XHR=YES, the task's header is not kept in pool. Instead, a copy of the header is placed in a reserved area immediately below the task image. The Executive uses the copy of the header rather than the actual header. When the task is checkpointed, the system writes the entire task image and the copy of the header into the checkpoint file. The header in the task image is left unchanged.

The options are YES and NO. If you specify /XHR=YES, the task is installed with an external header. If you specify /XHR=NO, the task is installed with a resident header.

/XHR correlates with the /XH option for the Task Builder. The default for /XHR and the ability for a user to override the option specified at task-build time depend on how the INSTALL task was built at system generation. See your system manager for this information.

Examples:

```
>INSTALL SCAN
```

Installs task SCAN. Priority and UIC are defaulted.

```
>INSTALL DM1:[1,111]SCAN.TSK;4/PRI=103
```

Installs task SCAN, file type TSK, version 4 on device DM1:, group number 1, member number 111, with a priority of 103(8).

```
>INS MAC/INC=4096./PAR=SYSCTL
```

Installs task MAC in the system-controlled partition SYSCTL and increases the task size by 4096(10) words.

Command Error Messages:

INS -- ADDRESSING EXTENSIONS NOT SUPPORTED

The command tried to install a task with a VSECT (virtual section) into a system that does not support the feature.

INS -- BASE ADDRESS MUST BE ON 4K BOUNDARY

The base virtual address of the task was not on a 4K boundary. This message applies only to mapped systems.

INS -- BASE MISMATCH COMMON BLOCK common-name

The base address of the partition did not match that of the common block.

INS -- CANNOT INSTALL PRIVILEGED TASK FROM NON-PRIVILEGED TERMINAL

This message applies to multiuser protection systems only. A nonprivleged user attempted to install a privileged task. Only a privileged user can install a privileged task.

INS (Cont.)

INS -- CAN'T INSTALL DIRECTIVE COMMON

An attempt was made to install a task in a directive common, which the system does not support.

INS -- CAN'T INSTALL EXECUTIVE COMMON

The executive commons (on systems that support executive partitions) cannot be installed at run time. The commons must be installed with the VMR INSTALL command. (See the RSX-11M/M-PLUS System Management Guide).

INS -- CAN'T REM A COMMON BLOCK

(RSX-11M-PLUS systems only.) An attempt was made to run a common block.

INS -- CHECKPOINT AREA TOO SMALL

The area allocated for checkpointing the task was smaller than the partition into which the task was being installed. This message applies only to systems that do not support the dynamic allocation of checkpoint space.

INS -- CHECKPOINT SPACE TOO SMALL, USING CHECKPOINT FILE

This is a warning message only. The checkpoint space allocated in the task image file is too small for the size of the task (usually because of the /INC keyword). The system supports the dynamic allocation of checkpoint space and will therefore use a checkpoint file to contain the checkpointed task.

INS -- COMMON BLOCK IS TASK PARTITION common-name

A task's request for access to a common block was rejected because the requested partition was a task partition.

INS -- COMMON BLOCK NOT LOADED common-name

The specified common block was linked to the task but had not been installed in the system. Install the common block, then install the task.

INS -- COMMON BLOCK OCCUPIED

An attempt was made to load a task into a common block that was already occupied.

INS -- COMMON BLOCK PARAMETER MISMATCH common-name

Parameters of a common block did not match those in the task's label block.

INS -- COMMON BLOCK SEGMENT COUNT ERROR

The command installed a resident library with overlays, but the number of overlay segments specified in the task header was different from the number specified in the segment descriptions.

INS -- EXTERNAL HEADERS NOT SUPPORTED

INSTALL first checks to see that the task was built with /XH specified. Then, it checks the feature mask bit of the system to see if external headers are supported. When external header support is not included in the system, you cannot install a task with an external header.

INS -- FILE NOT CONTIGUOUS

An attempt was made to install a noncontiguous task image file. Task images can only be contiguous files.

INS -- FILE NOT PROPERLY CLOSED

An attempt was made to install a file that was not properly closed (that is, locked). Since the file is locked, it is probably corrupted. Install a new copy of the file.

INS -- FILE NOT TASK IMAGE

Data in the label block was not correct, indicating that the file was not a task image.

INS -- FILE PROTECTION VIOLATION

An attempt was made to install a task to whose image file you do not have proper access. You must have read access to install a task image file.

INS -- ILLEGAL DEVICE ddnn:

The device specified at task build by the assign (ASG) option does not exist in the system. This is a warning message only. The task is installed.

INS -- ILLEGAL DEVICE/VOLUME

The specified device was not a valid task-residence device.

INS -- ILLEGAL FIRST APR

(Mapped systems only.) A privileged task, built to run using APR 4 or 5 as its base, was too large. Using APR 4, the task was larger than 12K; using APR 5, the task was larger than 8K.

If the Executive has been built to support 20K of address space, APR 5 is the only valid base APR for tasks mapping into the Executive. A privileged task that does not map into the Executive must use APR 0 as its base. (See the RSX-11M/M-PLUS Task Builder Manual for a description of the /PR switch.)

INS -- ILLEGAL PRIORITY

The value of the priority specified in the command was out of range (that is, not 1 through 250 decimal).

INS (Cont.)

INS -- ILLEGAL SLAVE ATTRIBUTE

(RSX-11M-PLUS systems only.) An attempt was made to install a task with the /SLV keyword, but the task's name is in the form ...RSX. The task is a prototype task and cannot be installed as a slaved task.

INS -- ILLEGAL USE OF name PARTITION OR COMMON

(RSX-11M-PLUS systems only.) An attempt was made to install a task in a CPU or secondary pool partition.

INS -- LENGTH MISMATCH COMMON BLOCK blockname

The length parameter for the common block, as described in the label block for the task image, did not match the corresponding length parameter defined in the system. A task's label block data must match system data for that task before it can be installed.

INS -- LOW POOL, TRY LATER

(Systems with pool monitoring support only.) During low pool conditions, the Pool Monitor Task (PMT...) temporarily disables install-run-remove and /CMD requests for nonprivileged users.

INS -- NO CHECKPOINT SPACE, ASSUMING NOT CHECKPOINTABLE

This is a warning message only. The command attempted to install the task as checkpointable, but the task was not built as checkpointable and therefore had no checkpoint space allocated in its task image file. Because the system does not support the dynamic allocation of checkpoint space, it considers the task not to be checkpointable.

INS -- NO CHECKPOINT SPACE OR DYNAMIC CHECKPOINT FILE

An attempt was made to install either an external header task (/XHR=YES) or a checkpointable task (/CKP=YES), but no checkpoint space or dynamic checkpoint file was available for it.

INS -- NO ROOM AVAILABLE IN STD FOR NEW TASK

No dynamic memory was available to enter the Task Control Block (TCB) in the System Task Directory (STD). The task could not be installed.

INS (Cont.)

INS -- NOT ENOUGH APRS FOR TASK IMAGE

(Mapped systems only.) The Task Builder allows the user to specify the virtual base address of a task image as a multiple of 4K. Privileged tasks that access the Executive start at either virtual address 100000(8) for a 16K Executive or at virtual address 120000(8) for a 20K Executive. If the virtual base address is set too high, there are not enough APRs remaining to map the task image. (See the RSX-11M/M-PLUS Task Builder Manual for information on privileged tasks.)

INS -- PARTITION NOT COMMON

A partition specified for a common area or library is not defined as a common partition.

INS (Cont.)

INS -- PARTITION parname NOT IN SYSTEM, DEFAULTING TO GEN

This is a warning message only. The specified partition does not exist, so the system attempts to install the task in the GEN partition.

INS -- PRIVILEGED TASK LARGER THAN 12K

A privileged task was larger than 12K words. Privileged tasks on an unmapped system have a maximum size of 12K.

INS -- PRIVILEGED TASK NOT MAPPED TO I/O PAGE

A privileged task was larger than 8K and therefore overlapped the I/O page. This message occurs if the task is installed with the /IOP=YES option.

INS -- R/O PARTITION pname NOT IN SYSTEM, DEFAULTING TO TASK'S

A read-only partition that does not exist in the system was specified in the command line. INSTALL will place the read-only portion of the multiuser task in the same partition in which the read/write portion of the task is placed.

INS -- SPECIFIED PARTITION FOR COMMON BLOCK

An attempt was made to install a task in a common block.

INS -- SPECIFIED PARTITION TOO SMALL

The task being installed was larger than the partition into which it was being installed.

INS -- TASK AND PARTITION BASES MISMATCH

(Unmapped systems only.) The base of the partition did not match the base of the task being installed.

INS -- TASK IMAGE ALREADY INSTALLED

The requested task image, which was checkpointable, had already been installed. On systems that do not support the dynamic allocation of checkpoint space, checkpointable tasks that have checkpoint space allocated can be installed only once; other tasks can be installed more than once (under different names).

INS -- TASK IMAGE I/O ERROR

INSTALL could not read the task image file or could not rewrite the task image header. (The device is write-locked.)

INS -- TASK IMAGE VIRTUAL ADDRESS OVERLAPS COMMON BLOCK blockname

The virtual addresses reserved for the task image overlap those reserved for the common block specified in the message. A corruption of the task image file probably caused the overlap.

INS (Cont.)

INS -- TASK MAY NOT BE RUN

This message can be issued for the following reasons:

1. An attempt was made to run a CLI task. CLI tasks are activated by the system; they cannot be activated with the install-run-remove option of the RUN command.

2. (RSX-11M-PLUS systems only.) An attempt was made to run a task whose name is in the form ...xxx or xxx$$$. Such tasks must be started by the system with the task name xxxTnn (TTnn: is the issuing terminal).

INS -- TASK NAME ALREADY IN USE

An attempt was made to install a task with the same name as one already in the system.

INS -- TASK NOT INSTALLED WITH EXTERNAL HEADER

(RSX-11M-PLUS systems only.) This is a warning message to indicate that the specified task is installed with its header in pool (the dynamic storage region).

INS -- TASK REQUIRES SYSTEM CONTROLLED PARTITION

(RSX-11M systems only.) An attempt was made to install a task that was built with external header (/XH) support and as checkpointable (TKB /CP, INS /CKP=YES). Such tasks must be installed in a system-controlled partition.

INS -- TOO MANY COMMON BLOCK REQUESTS

A task made too many requests for common blocks. A task is limited to seven requests.

INS -- TOO MANY LUNS

A task requested more than 255(10) LUNs to be assigned.

INS -- UNDEFINED COMMON BLOCK blockname

A task referenced a common block that had not been defined in the system. Usually, this message indicates that the task was built for another system.

INS -- USER D-SPACE NOT SUPPORTED

(RSX-11M-PLUS systems only.) An attempt was made to install a task with separate instruction and data space on a system that does not support user D-space. (User D-space is a system generation option.)

INS (Cont.)

INS -- WARNING -- PRIVILEGED TASK OVERMAPS THE I/O PAGE

A privileged task that is mapped into the Executive is usually also mapped into the I/O page to access the registers for the KT11 and other devices. Many tasks do not require this access and can use the additional 4K words of virtual address space for the task image. This message warns that a task that may require access to the I/O page might have grown too large.

LOA

LOAD (P)

The LOAD command reads a nonresident (loadable) device driver into memory and, if necessary, relocates the data base constructs and interrupt-vector linkages required to allow access to the device. On RSX-11M-PLUS systems, the task CON constructs interrupt-vector linkages.

The LOAD command eliminates the need to link infrequently used device drivers permanently into the Executive. (Executive support of loadable device drivers is a system generation option on RSX-11M systems but is always included on RSX-11M-PLUS systems.) The result is the potential for an increase in the amount of system dynamic memory.

You can load drivers that are up to 8K words in length. Note, however, that the loadable device driver itself must map to any locations above 4K.

The driver for a device, for example ZY:, can indicate association with a partition by allocating one word in the driver and labeling it with the global symbol $ZYCOM. If $ZYCOM is defined in a driver, you cannot load the driver until you create ZYCOM (LOA writes the PCB address of ZYCOM into $ZYCOM).

Format:

LOA[D] dd:[/keyword(s)]

dd:

A 2-character ASCII loadable device driver name.

Keywords:

/PAR=parname

Specifies the partition (parname) into which the driver is to be loaded.

On RSX-11M systems, the specified partition can be a task partition or a system-controlled partition.

On RSX-11M-PLUS systems, the specified partition can only be a system-controlled partition.

All loadable drivers are usually placed in the same partition, by convention DRVPAR. This has the advantage of preventing fragmentation of the GEN partition.

On RSX-11M systems, this convention normally ensures that all loadable drivers remain below 124K in memory (the maximum system image size for the SAVE task on RSX-11M).

When the command line omits this keyword, the system loads the driver into the partition specified when the driver was built.

LOA (Cont.)

/CTB=cca[,b...]

(RSX-11M-PLUS systems only.) Specifies that the multidriver controller Controller Table Block (CTB) in the resident data base be modified instead of the symbol $ddCTB in the loadable data base. Note that the keyword is necessary only if the driver contains a loadable data base; to load most drivers, this keyword is not required. (See the RSX-11M-PLUS Guide to Writing an I/O Driver for more information.)

When specifying a CTB, cc is the multidriver controller mnemonic and a[,b...] are slots in the CTB's Controller Request Block (KRB) table pointing to the KRBs in the loadable data base. The slots are named A, B, C, D, E, F, H, J, K, L, M, N, P, R, S, and T.

For example, if a system contains a DB:-type device on RHA, you can issue the following command to load a DR:-type device with a loadable data base for RHB:

```
>LOA DR:/CTB=RHB
```

/SIZE=parsize

Specifies the minimum size (in words) of the partition into which the driver is to be loaded. If the partition is system-controlled, a subpartition will be created at this size.

parsize is rounded up to the next highest unit of 100 (octal) words and must be less than 100000.

/HIGH

If the partition is system-controlled, /HIGH causes the driver to be loaded as high in the partition as possible; absence of /HIGH loads the driver as low in the partition as possible.

If the partition is not system-controlled, the driver occupies the entire partition whether or not you specify /HIGH.

Examples:

```
>LOAD   MM:                 !LOAD TU16 DRIVER (MMDRV)

>LOA    LP:/PAR=DRVPAR      !LOAD LP11 DRIVER (LPDRV) INTO DRVPAR
```

Notes:

- Rigid instructions for building loadable device-driver tasks are defined in the RSX-11M or RSX-11M-PLUS Guide to Writing an I/O Driver. Note that the system generation procedures include provisions to simplify the task building of drivers.
- It is not possible to make all device drivers loadable. Also, not all loadable drivers can have loadable data bases.

LOA (Cont.)

- The LOAD command requires that a driver's TSK and STB files reside under the system UIC on the system disk (LB:). For example, the command

  ```
  LOA  DT:
  ```

  requires that the files DTDRV.TSK and DTDRV.STB reside on LB: under the appropriate system UIC. The command SET /SYSUIC displays and defines the system UIC; the usual values, however, are [1,50] for an unmapped system and [1,54] for a mapped system.

- The LOAD command does not initiate checkpointing to free a space in a partition.

- The LOAD command requires pool space as follows:

  1. If the driver data base is being loaded, the data base needs contiguous pool space equal to its size.

  2. In a mapped system, each interrupt entry in the driver needs pool space for an Interrupt Control Block (ICB).

  3. If the driver is being loaded into a system-controlled partition, the Partition Control Block (PCB) needs pool space.

Command Error Messages:

LOA -- CANNOT LOAD/UNLOAD A PSEUDO DEVICE

The device you attempted to load is a pseudo device. Pseudo devices do not have drivers.

LOA -- CTB name DOES NOT EXIST

(RSX-11M-PLUS systems only.) The Controller Table name specified with the /CTB keyword does not exist in the resident data base.

LOA -- CTB BASE name IS A DUPLICATE

(RSX-11M-PLUS systems only.) The loadable data base contains a Controller Table (CTB) with a name that is the same as a CTB name in the resident data base. CTB names must be unique.

LOA -- CTB name IS NOT SUPPORTED BY DRIVER, NOT LOADED

(RSX-11M-PLUS systems only.) The device driver's dispatch table does not have all the Controller Table mnemonics that the rest of the data base (the DCBs and CTBs) implies that it has, or the CTB is defective. A defective CTB may contain a wrong name or its link to the DCB may be wrong.

LOA (Cont.)

LOA -- DCB TABLE FOR CTB name IS FULL

(RSX-11M-PLUS systems only.) LOAD attempted to write the address of the Device Control Block (DCB) for the loadable data base into the DCB table of the specified resident Controller Table, but there were no null entries in the DCB table. (Refer to the RSX-11M-PLUS Guide to Writing an I/O Driver.)

LOA -- DEVICE dd: NOT IN SYSTEM

The data base for the device driver was not in the system or in the driver's task image.

LOA -- DEVICE NOT MOUNTED

The system device (LB:) was not mounted.

LOA -- DRIVER ALREADY RESIDENT

The specified device driver had already been loaded or is permanently resident.

LOA -- DRIVER BEING LOADED OR UNLOADED

The Executive was effecting another request to load or unload the driver.

LOA -- DRIVER BUILT WITH WRONG EXECUTIVE STB FILE

The STB file for the driver was not compatible with the current Executive. The task build probably specified an RSX11M.STB file that was not for the current system.

LOA -- DRIVER DISPATCH TABLE IS INCONSISTENT

(RSX-11M-PLUS systems only.) The device driver's dispatch table is illegally formatted. Refer to the RSX-11M-PLUS Guide to Writing an I/O Driver.

LOA -- DRIVER LOAD/UNLOAD CALLS NOT SUPPORTED

(RSX-11M systems only.) The requested driver included the global symbols $ddLOA or $ddUNL in its source. These symbols are reserved for future use by the LOAD and UNLOAD commands.

LOA -- FILE filename HAS ILLEGAL STB FORMAT

The driver's STB file contained an illegal object code or data record format.

LOA -- FILE filename NOT A VALID DRIVER TASK IMAGE

The driver's task image was either overlaid or had a task header.

LOA (Cont.)

LOA -- FILE ddDRV.TSK NOT CONTIGUOUS

The file ddDRV.TSK was not contiguous. Device drivers (like all "task" images) must be contiguous.

LOA -- ILLEGAL DRIVER TASK APR USAGE

A device driver must be built for APR 5 and must be less than 8K (for example, PAR=DRVPAR:120000:40000). This message applies to mapped systems only.

LOA -- ILLEGAL USE OF PARTITION or REGION name

(RSX-11M-PLUS systems only.) The partition into which the driver was to be loaded was a secondary pool or CPU partition.

LOA -- ILLEGAL VALUE FOR SYMBOL symname IN FILE filename

The symbol symname is defined to an illegal value in file ddDRV.STB. This can occur for several reasons, some general and some specific to individual symbols. For example, symbols cannot have odd values, most symbols cannot be defined as zero, $ddTBL must exist and have a value less than $ddEND, and mapped loadable drivers cannot reference $INTSV.

LOA -- INSUFFICIENT POOL SPACE

The required amount of system dynamic memory was not available.

LOA -- INSUFFICIENT ICB POOL SPACE FOR CPU CPx

There is not enough processor-dependent dynamic memory to allocate an Interrupt Control Block for the CPU designated in the error message. This message applies only to RSX-11M-PLUS multiprocessor, I- and D-space systems.

LOA -- INTERRUPT VECTOR ALREADY IN USE

(RSX-11M systems only.) A driver interrupt vector does not point to one of the nonsense interrupt entry points.

LOA -- INVALID DRIVER DATA BASE AT OFFSET xxxx IN FILE filename

The driver had an invalid data base value at offset xxxx relative to the symbol $ddDAT. This can occur for three general reasons.

1. An invalid value, for example, D.UCB was odd.

2. The value for a word is not within the bounds of the loadable data base. LOAD produces an error message citing the offending value.

3. An element is missing from the loadable data base. LOAD attempts to verify one kind of data structure as another kind. For example, if a DCB is missing, LOAD tries to verify the following UCB as the DCB. LOAD cites the DCB as being incorrect.

LOA (Cont.)

LOA -- INVALID INTERRUPT VECTOR

(RSX-11M systems only.) The interrupt vector address specified in the driver data base was too high for the current system.

LOA -- KRB name NOT IN LOADABLE DATA BASE

(RSX-11M-PLUS systems only.) You are attempting to load the driver for a MASSBUS device with a loadable data base. The special symbol (KRBname), which defines the location of the KRB, is not defined in the loadable data base. Refer to the RSX-11M-PLUS Guide to Writing an I/O Driver.

LOA -- KRB TABLE OF CTB name WILL NOT ACCEPT KRB name

(RSX-11M-PLUS systems only.) You are attempting to load the driver for a MASSBUS device with a loadable data base. If this operation is to be successful, two conditions must exist:

1. The appropriate slot in the CTB (Controller Table) must exist.

2. The slot in the CTB must be unused.

When you get this error message, one of these conditions does not exist. Refer to the RSX-11M-PLUS Guide to Writing an I/O Driver.

LOA -- LOADABLE DRIVER SUPPORT NOT IN SYSTEM

The system generation option to support loadable device drivers was not chosen or necessary routines are not in the Executive.

LOA -- OPEN FAILURE ON FILE filename

LOAD encountered an error in attempting to open the specified file.

LOA -- PARTITION parname BUSY

(RSX-11M systems only.) The user-controlled partition or subpartition into which the driver was to be loaded was already occupied.

LOA -- PARTITION parname IS A COMMON

(RSX-11M systems only.) An attempt was made to load a device driver into a common partition. A device driver cannot be loaded into a common partition.

LOA -- PARTITION/REGION name IS A COMMON

(RSX-11M-PLUS systems only.) An attempt was made to load a device driver into a common partition or region. A device driver cannot be loaded into a common partition or region.

LOA (Cont.)

LOA -- PARTITION parname IS NOT A COMMON

(RSX-11M systems only.) The symbol $ddCOM is globally defined in the driver. The partition ddCOM exists, but it is not a common partition.

LOA -- PARTITION/REGION name IS NOT A COMMON

(RSX-11M-PLUS systems only.) The symbol $ddCOM is globally defined in the driver. The partition ddCOM exists, but it is not a common partition or region.

LOA -- PARTITION parname NOT IN SYSTEM

(RSX-11M systems only.) The partition specified either in the LOAD command or at task build was not in the system.

LOA -- PARTITION/REGION name NOT IN SYSTEM

(RSX-11M-PLUS systems only.) You are attempting to load a driver into a partition that does not exist in the system, or LOAD found a symbol $xxCOM in the driver and the region xxCOM does not exist in the system.

LOA -- PARTITION parname TOO SMALL

The partition into which the driver was to be loaded was not large enough to contain it.

LOA -- REGION/PARTITION name IS A COMMON

You have attempted to load a device driver into a common partition or region. A device driver cannot be loaded into a common partition or region.

LOA -- SYMBOL symname IS DOUBLY DEFINED BY FILE filename

The symbol symname is defined twice in the specified file. Duplicate symbols are illegal. The driver is not loaded.

LOA -- SYMBOL symname IS UNDEFINED IN FILE filename

The symbol symname was found in the specified file, but the symbol was not defined.

LOA -- TASK AND PARTITION parname BASES MISMATCH

(RSX-11M systems only.) The base address of the partition into which the driver was to be loaded did not match the base address of the partition address for which the driver task was built. This message applies to unmapped systems only.

LOA -- TASK IMAGE I/O ERROR IN FILE filename

The device is probably write-locked. LOAD could not read the task image file or could not rewrite the task image header.

LOA (Cont.)

LOA -- TOO MANY SYMBOLS OF THE FORM $xxTMO IN FILE filename

(RSX-11M-PLUS systems only.) LOAD is attempting to extract global symbols of the form $xxTMO from the driver's symbol definition file. There are more symbols of this form than LOAD can process.

LOA -- WARNING - KRB name INTERRUPT VECTOR nnn IN USE

(RSX-11M-PLUS systems only.) You have attempted to load a driver that specifies an interrupt vector that is not pointing to a nonsense interrupt entry point address. This is usually caused by a previously loaded driver that has used this vector.

LOAD has correctly loaded the driver. The problem must be corrected before the device is brought on line.

LOA -- WARNING - KRB name INTERRUPT VECTOR nnn TOO HIGH

(RSX-11M-PLUS systems only.) You have attempted to load a driver that specifies an interrupt vector address that is higher than the highest permissible vector address in your system.

When you get this message, LOAD has loaded the driver correctly. You must use the reconfiguration services to adjust the vector address in the driver before placing the device on line. (See the RSX-11M/M-PLUS System Management Guide for more information on the reconfiguration services.)

LOA -- WARNING - LOADABLE DRIVER LARGER THAN 4K

Loadable drivers can be up to 8K words in length. The driver must explicitly map to any location above 4K words.

LUN

LOGICAL UNIT NUMBERS (NP)

The LUN command displays the static LUN assignments for a specified task. (Static assignments are those recorded in the task's disk image file.) The display consists of a list of physical device units in one column and their corresponding LUNs in an adjoining column.

When the specified task is running, the display does not necessarily reflect the running task's assignments. For example, an Executive directive issued from within the task (ASSIGN LUN) can alter the LUN assignments.

If the specified task was initiated by the install-run-remove option of the RUN command, the task has no static LUN assignments. In this case, LUN displays the message:

```
LUN -- TASK NOT IN SYSTEM
```

Format:

```
LUN[S] taskname
```

Example:

```
>LUN XKE
TI0:  1.
SY0:  2.
SY0:  3.
SY0:  4.
LB0:  5.
```

The display shows static assignments for LUNs 1, 2, 3, 4, and 5, which are recorded in the task image file header; no other LUNs are statically assigned to the task XKE.

Command Error Messages:

```
LUN -- NO LUNS
```

The task that is the argument of the LUN command did not have any logical assignments. This is an informational message.

```
LUN -- TASK NOT IN SYSTEM
```

The specified task is not installed or the task was initiated by the install-run-remove option of the RUN command. This is an informational message.

MOU

MOUNT (NP,P)

The MOUNT command allows the file system software access to physical devices. For all volumes on these devices, MOUNT creates the file system control blocks that the Ancillary Control Processors (ACPs) use to support data access on the device. MOUNT also declares, provided an on-line access path exists, that the volume is logically on line for access. The command then requests the ACP to mount the volume or volume set. Mounting a volume also resets the QIO and Error counts to zero (0). These counts are used by the Error Logging facility.

The MOUNT command supports three types of devices: file-structured, sequential, and non-file-structured. Disks and DECtapes are examples of file-structured devices. These devices are usually controlled by F11ACP, which supports Files-11 Structure Level 1. Magnetic tapes are an example of a sequential device. These tapes are usually controlled by MTAACP, which supports both ANSI (X3.27-1978) and unlabeled tape formats. Non-file-structured devices do not have to be mounted on RSX-11M but must be mounted foreign on RSX-11M-PLUS.

When you mount a Files-11 or magnetic tape volume, there are several default ACPs that MOUNT can use. MOUNT first defaults the ACP name to ddnnF1. This allows you to tailor the ACP that controls a specific volume and then name that ACP after the volume. For example, if you tailor F11ACP for an RK06 disk and install it as DM01F1, then when you issue a MOUNT command for DM1:, MOUNT searches for the ACP DM01F1. For disks, if MOUNT cannot find an ACP whose name is in the form ddnnF1, it searches for an ACP whose name is in the form ddAACP and then F11ACP. For magnetic tapes, the default ACPs are ddnnF1, ddAACP, and then MTAACP. Note that (for privileged users) these defaults can be overridden by using the /ACP keyword.

It is recommended for slow disk devices such as DECtape that a separate ACP be used. Thus, you should install a copy of F11ACP as DTAACP for DECtape and a copy as DDAACP for DECtape II.

RSX-11M systems permit specific tasks, such as INI and DSC, access to unmounted volumes. However, it is necessary to mount a magnetic tape if it is an ANSI standard tape or if you want to process the tape as an unlabeled tape with FCS or RMS on a system that supports ANSI magnetic tapes. If the system does not support ANSI tapes, FCS processes unmounted magnetic tapes as unit record devices.

RSX-11M-PLUS systems deny access to unmounted volumes. The /FOReign keyword allows you to issue MOUNT commands for unformatted or nonstandard volumes. For example, to initialize a disk as a Files-11 volume, you must first mount the volume as foreign and then issue the INI command. (You should not specify an ACP.)

When a device is dismounted, outstanding I/O is allowed to complete, but no additional files can be accessed on that volume (see the description of the DISMOUNT command).

MOU (Cont.)

MOUNT also classifies devices and volumes into three other types: public, shared, and nonshared. A public volume is one that all system users can access. Public volumes are the only type supported by nonmultiuser systems. A shared volume is one that can be mounted multiple times by multiple users. A nonshared volume (private) is one allocated to a single user. See Chapter 2 for more information on device types.

A nonprivileged user can only mount a volume on:

- The user's private device. No other user can access or mount the volume until the volume is dismounted and deallocated.
- Any other device that has not been allocated or set public. If another user mounts the volume, that user can also access it.

Only one user can mount a magnetic tape volume (or volume set) at one time.

Some file attributes and positioning information can be supplied after the volume is mounted with the MAG utility. For more information, see the IAS/RSX-11 I/O Operations Reference Manual.

If the device is not ready when you attempt to mount the volume, MOUNT waits from 30 to 60 seconds for the device to become ready. If the device is still not ready after the waiting period has elapsed, MOUNT issues an error message.

The following descriptions of the MOUNT command formats illustrate the parameters and keywords associated with Files-11 volumes and with ANSI magnetic tapes. All the keywords are collectively described following the format descriptions.

You can use a hyphen (-) as a line terminator to extend the MOUNT command line when selected keywords cause the command to exceed 80 characters (or whatever buffer size has been specified for the entering terminal). You can use any number of continuation lines, but the total command line cannot exceed 255(10) characters.

Note that since the override volume label keyword (/OVR) is a privileged option of the MOUNT command in a multiuser protection system, a nonprivileged user must always specify a volume label.

Formats:

Files-11 Disk or DECtape Format:

```
MOU[NT] ddnn:[label][/keyword(s)]
```

ddnn:

Device unit on which the volume is to be mounted. Default: none; must be specified.

MOU (Cont.)

label

The Files-11 volume label may be null or up to 12(10) characters in length. It is used to ensure that the correct volume is being mounted. In a multiuser protection system, the command must include a volume label unless the privileged /OVR keyword is present.

/keyword(s):

MOUNT keywords for Files-11 devices override corresponding values in the volume's home block.

/ACP=option	/PRO=option
/DENS=density	/PUB
/EXT=block-count	/[NO]SHARE
/FOR	/UIC=uic-spec
/FPRO=[system,owner,group,world]	/UNL
/LOCK=option	/VI
/LRU=directory-count	/[NO]WAIT
/OVR	/WIN=option
/PARM="user parameters"	/[NO]WRITE

ANSI Magnetic Tape Format:

Magnetic tapes, unlike disks and DECtapes, can be mounted by the set as well as singly. In fact, when you mount a single magnetic tape, you are mounting a set consisting of only one tape. A tape set consists of logically related records or files written on one or more reels of tape. Only the first tape in the set has to be loaded on a device at the time the MOUNT command is issued, but all tapes in the set can be loaded on different devices when the command is issued.

The tape set is identified by a File Set Identifier. Each tape in the file set is identified by a Volume Identifier. By default, the File Set ID is the same as the Volume ID of the first reel of tape in the set. If this is true for your tape set, it is not necessary to specify the Volume IDs for the tapes (although it is recommended).

Volume Identifiers should be assigned by the system manager and should be unique within the installation. The Volume ID is usually the reel number of the physical tape. A File Set Identifier, however, is a name chosen by the user to refer to his or her own tape.

MOU (Cont.)

If your tape set processing uses more volumes than you specified with the /VOL keyword, you can use any expired or newly initialized tape for the output volume. For input, you can use only the next volume in the tape set. To determine if the new input tape is the correct one, the system checks the tape's File Set ID, file sequence number, and file section number. If specified, the system also checks the Volume ID.

```
MOU[NT] device-list:[file-set-ID] [/keyword(s)]
```

device-list

One or more device names on which the volume or volume set is to be mounted. More than one device name can be specified only for multivolume ANSI magnetic tape sets. If the command specifies more than one device name, the names must be separated by commas and enclosed in parentheses, that is:

```
(ddn:,ddn:,ddn:...).
```

Note that when you specify more than one device name, you must always access the tapes through the first name given in the device list. (This also applies when you dismount the tape set.) If you attempt to access a tape through another device name, you will get an error message.

file-set-ID

The File Set Identifier (or File Set ID) can be up to 6 characters in length. The File Set ID is the name you choose for the tape set. By default, it is the same as the first Volume Identifier (Volume ID) in the volume set. To create a tape set with a File Set ID that is different from the Volume ID of the first tape in the set, specify both the File Set ID and the first tape's Volume ID.

If you are mounting a newly initialized tape, you can specify your own File Set ID by using a form of the following command line (note that the /VOL keyword is used because the File Set ID and Volume ID are not the same):

```
>MOU MM:MYSET/VOL=A234
```

See the description of /VOL for more information about Volume IDs.

File Set IDs can use the following characters: the digits 0 through 9, the uppercase letters A through Z, and the following special characters:

```
<space> !  " % & ' ( ) * + , - .  / :  < = > ?  ;
```

To use a name that contains a special character, enclose the name in quotation marks. To use a quotation mark in the name, you must use two quotation marks within the quoted string. For example, the label T"1% should be specified as "T""1%".

MOU (Cont.)

Any lowercase letters specified in a File Set ID or Volume ID are converted to uppercase before any operations are performed on the tape. Any other invalid character is converted to a question mark (?).

/keyword(s):

/ACP=option	/OVRFSID
/BS=n	/PARM="user parameters"
/CC=option	/PRO=option
/DENS=density	/PUB
/FOR	/RS=n
/FPRO=protection-spec	/[NO]SHARE]
/[NO]HDR3	/TR=option
/[NO]LABEL	/UIC=[uic]
/LOCK=option	/VI
/OVR	/VOL=(list)
/OVRACC	/[NO]WAIT
/OVREXP	/[NO]WRITE

Keywords:

/ACP=option (P)

Specifies the name of the ACP to be used as the file processor for the volume being mounted. The option can be the name of a task that is installed as an ACP or it can be UNIQUE, which specifies that a dedicated ACP is to be used for the volume.

You only need to specify an ACP in special cases. If an ACP has been written for a customer application in your installation, you will need to use that ACP for volumes used by that application.

When you specify the UNIQUE option, MOUNT creates a copy of the F11ACP if the device is a disk or DECtape or of MTAACP if the device is a magnetic tape. This unique ACP is given a name in the form ddnnF1 or ddnnAP. When the volume is dismounted and the file processor exits, the ACP is automatically removed.

Default: Depends on the device type.

MOU (Cont.)

/BS=n

Specifies the block size for an unlabeled magnetic tape volume or the block size for files on an ANSI labeled tape that are Level 1 or 2 (do not have an HDR2 record). The value for n can be from 14 (for unlabeled tapes) or 18 (for ANSI tapes) through 16000. /BS also specifies the default block size for newly created files on an ANSI magnetic tape.

/CC=option

Specifies the record type for an unlabeled magnetic tape volume, or the record type for files on ANSI labeled tapes that are Level 1 or 2 (do not have an HDR2 record) or that are Level 3 but do not have a system code (HDR CP 61) beginning with DEC or OS. The options are:

```
FOR
LIST
NONE
```

These options correspond to the FORTRAN keywords for the OPEN statement.

/DENS=density

The density (bits per inch or bpi) of the medium loaded on the drive. Acceptable density values depend on the device type as indicated below:

TE16	800 bpi (or LOW) or 1600 bpi (or HIGH)
TS11	1600 bpi
TSV05	1600 bpi
TU45	800 bpi (or LOW) or 1600 bpi (or HIGH)
TU77	800 bpi (or LOW) or 1600 bpi (or HIGH)
TU78	1600 bpi or 6250 bpi
TU80	1600 bpi

Defaults:

TE16	/DENS=800
TS11	/DENS=1600
TSV05	/DENS=1600
TU45	/DENS=800 (or LOW)
TU77	/DENS=800
TU78	/DENS=6250
TU80	/DENS=1600

If you specify more than one device type in the command line but do not specify a density, the default is the lowest density supported by all of the devices.

/EXT=block-count

Specifies the number of blocks by which a file can be extended when it exhausts its space allocation. The block-count must be 1 through 255(10).

Default: The value specified when the volume was initialized.

MOU (Cont.)

/FOR

Indicates a foreign (non-Files-11) volume.

On RSX-11M, this keyword is recommended but not required for mounting foreign volumes. If you do not mount the volume, access to the volume is unrestricted. If you specify /FOR when you mount a volume on a private device, no one else can access it.

On RSX-11M-PLUS, you must always specify /FOR when mounting a foreign volume.

If you do not specify an ACP name (with /ACP=option), a file system (an ACP) cannot access the volume. Absence of an ACP name permits tasks (such as INI, DSC, BAD, or user tasks executing non-file-structured device QIOs) access to non-Files-11 volumes.

/FPRO=protection-spec

Specifies the default file protection for files created on a Files-11 disk while the disk is mounted. The protection specification has two formats:

(SYSTEM:RWED,OWNER:RWED,GROUP:RWED,WORLD:RWED)

or

[RWED,RWED,RWED,RWED]

The access codes consist of four 4-code groups in the access rights word as follows:

R - Read
W - Write
E - Extend
D - Delete

In each instance, the absence of the code means that the applicable user is denied the access right.

Default: Values taken from volume home block.

/[NO]HDR3

Specifies whether an HDR3 label is to be written when creating new files. The /NOHDR3 keyword is needed only when it is known that the target system cannot handle a tape with an HDR3 label. This keyword has no other effect or application.

Default: /HDR3.

MOU (Cont.)

/[NO]LABEL

Specifies that a magnetic tape volume is in ANSI format (/LABEL) or unlabeled (/NOLABEL). Default: /LABEL.

/LOCK=option

Specifies the default value for the DISMOUNT /LOCK keyword.

On RSX-11M, this keyword is valid only for magnetic tape volumes.

On RSX-11M-PLUS, the keyword is valid for magnetic tapes and DB:-, DM:-, and DU:-type disks.

The options are:

Nounload
Unload
Virtual

When you specify the Nounload option (/LOCK=N), the volume valid bit is cleared, but the disk is not spun down or the tape unloaded. This is the default option for volumes mounted foreign and no ACP specified. For example, when you want to initialize a volume as a Files-11 volume, you first issue a MOUNT command with the /FOR keyword. After initializing the volume, the usual procedure is to dismount it and then issue another MOUNT command, using a standard ACP. Since the default lock value is N, the volume remains spinning or loaded and you can immediately issue the MOUNT command that specifies the ACP.

When you specify the Unload option (/LOCK=U) for disks, the volume valid bit is cleared and, if the drive supports the spin-down function, the disk is powered down. When you specify this option for tapes, the tape is rewound and unloaded. This option is the default lock value for all volumes mounted with a standard ACP.

On RSX-11M-PLUS systems, you cannot specify /LOCK=U for a multiunit device (for example, an RC25) unless you are a privileged user. See the description of the DISMOUNT command for more information.

The Virtual option is privileged. When you specify /LOCK=V, the volume valid bit is not cleared and the disk is not spun down or the tape unloaded.

See the description of the DISMOUNT command for more details.

/LRU=directory-count

Specifies the approximate number of directories that will be accessed simultaneously while the volume is mounted. The F11ACP maintains a list of the most recently used directories. The value specified for /LRU sets the number of entries in this list. In general, directory operations can be speeded up significantly by increasing the number of entries.

MOU (Cont.)

If a directory appears in the list, no device I/O is required for finding the directory in the Master File Directory (MFD). In addition, directory operations do not require the directory file header to be read.

Legal values for directory-count range from 0 through 127(10). Note that increasing the value for /LRU increases the number of File Control Blocks (FCBs) used and may increase the amount of system pool used. See the appropriate system generation manual for more information.

Also note that if you specify /LRU=0, the F11ACP will not keep a list of directories. This is not recommended and could have an adverse effect on system efficiency.

If you do not use /LRU, the default for directory-count is the value specified when the volume was initialized.

/OVR (P)

For disks and DECtapes, instructs the MOUNT command to override label processing so that a volume can be mounted without specifying a volume label.

For magnetic tapes, instructs the MOUNT command to override File Set ID processing on the first tape of a tape set so that a volume can be mounted without specifying a File Set ID.

When you specify /OVR, the File Set ID is taken from the first volume in the set. However, MOUNT still checks the IDs for the remaining volumes in the set. This prevents improper tape processing. (Note that Volume IDs for the tape volumes are overridden if they are not specified, whether or not you use /OVR.)

/OVRACC (P)

Instructs the MOUNT command to override the protection for an ANSI magnetic tape volume.

/OVREXP (P)

Instructs the MOUNT command to override the expiration date on the tape volume(s).

/OVRFSID (P)

Instructs the MOUNT command to ignore File Set Identifiers on the second and subsequent magnetic tape volumes of a multivolume set. /OVRFSID may cause improper tape processing. This keyword should be used only if you know the volume does not conform to the ANSI standard.

MOU (Cont.)

/PARM="user-parameters"

Instructs the MOUNT command to pass nonstandard parameters from the command line to a foreign ACP. The user-parameter string can consist of up to a maximum of 40(10) characters enclosed in quotes ("). The quotation marks are not included when the characters are counted.

If the quoted parameter itself includes a quotation mark, the quotation mark must be followed by another quotation mark.

This keyword is valid only with foreign (/FOR) volumes.

/PRO=protection-spec

Specifies the default volume protection for a Files-11 disk. The protection specification has two formats:

(SYSTEM:RWCD,OWNER:RWCD,GROUP:RWCD,WORLD:RWCD)

or

[RWCD,RWCD,RWCD,RWCD]

The access codes consist of four 4-code groups in the access rights word as follows:

R - Read
W - Write
C - Create at volume level; extend at file level
D - Delete

In each instance, the absence of the code means that the applicable user is denied the access right.

Default: Values specified when the volume was initialized.

/PUB

Specifies that the volume is accessible by all users, depending on the volume and file protection set for the volume. The drive on which the volume is mounted is deallocated and set public if necessary.

Defaults: /PUB if the volume is public
/SHARE if the volume is not allocated or set public
/NOSHARE if the volume is allocated to a user

See Chapter 2 for more information on public devices.

/RS=n

Specifies the number of characters in a record for unlabeled magnetic tape volumes or the number of characters in a record for files on ANSI labeled tapes that are Level 1 or 2 (do not have an HDR2 record). The value for n can be from 1 through the value specified with /BS.

MOU (Cont.)

/[NO]SHARE

/SHARE specifies that a volume can be mounted multiple times by one or more users. Each user who mounts the volume gains access to it based on the volume and file protection established for the volume when it was first mounted. After all users have issued a DISMOUNT command and all file activity has ceased, the volume is released by the file processor. The volume is deallocated and set nonpublic if necessary.

/NOSHARE specifies that the volume is reserved for dedicated use by the first user who mounted the volume. No other users can access the volume. The drive on which the volume is mounted is allocated to the user's terminal and set nonpublic if necessary.

Defaults: /PUB if the volume is public
/SHARE if the volume is not allocated or set public
/NOSHARE if the volume is allocated to a user

/TR=option

Specifies the kind of character translation used in read and write operations on an unlabeled magnetic tape volume. The options are:

NONE	No translation takes place.
EBCDIC	Translation from EBCDIC to ASCII for read; ASCII to EBCDIC for write. (Note that translations are not completely symmetrical. Some characters in one set do not have equivalent characters in the other set.)
UT1, UT2, UT3	Translation done by user-supplied Translation tables that have been previously linked into MTAACP. Up to three tables may be linked.

Default: no translation takes place. (See the IAS/RSX-11 I/O Operations Reference Manual for more information on character translation.)

/UIC=[uic]

Specifies the User Identification Code (UIC) for the volume owner in the form [group,member]. The square brackets are required syntax. The numbers for group and member range from 1 through 377(8). This UIC overrides the one specified when the volume was initialized.

MOU (Cont.)

/UNL

Specifies that the volume index file should be unlocked for write access by a system user. When locked, the index file is read-only; when unlocked, it is read or write. This keyword is typically required when you are recovering lost blocks or performing other maintenance with the VFY utility. (See the RSX-11M/M-PLUS Utilities Manual for more information.) Note that this keyword has nothing to do with device write-locking.

Default: locked.

/VI

Displays the volume information on the entering terminal. The information displayed is the characteristics with which the volume was mounted.

For Files-11 volumes, the volume information format is:

```
Volume Information
Class:        Files-11
Device:       ddnn
Volume label:label
Owner:        [uic]
Protection:   [system,owner,group,world]
Default:      [system,owner,group,world]
Processor:    ACP name
```

For last-track devices (for example, DL:, DM:, and DR:) and for DU:-type devices, /VI also displays, in octal, the pack serial number of the volume.

For foreign volumes, the volume information format is:

```
Volume Information
Class:        Foreign
Device:       ddnn
Volume label:label
```

For magnetic tape volumes, the volume information format is:

```
Volume Information
Class:        ANSI labeled tape or Unlabeled tape
Device:       ddnn
Fileset ID:   id
Volume ID:    id
Owner:        [uic]
Processor:    ACP name
```

For magnetic tape, the volume information repeats the device and label lines if multiple units were specified and omits the volume protection and characteristics defaults (volume protection and characteristics do not apply to magnetic tapes).

MOU (Cont.)

/VOL=(list)

Specifies the Volume Identifier (Volume ID) for an ANSI magnetic tape. If you specify more than one Volume ID (for a multivolume tape set), the Volume IDs must be separated by commas.

Initially, the tape with volume-ID-1 must be physically loaded on the first device unit specified in the command line. The remaining tapes may or may not be loaded on other units specified in the command line. You must specify Volume IDs in the order in which the volumes make up the volume set because the system searches for and/or requests each successive volume in the specified Volume ID order.

The second and succeeding volumes should be mounted on the additional units in the order in which they were specified in the command line or as requested by console messages from MTAACP.

If more tapes are required than were specified at mount time, MTAACP automatically adds additional volumes to the set.

When the command line is issued, the system checks the tape on the first drive to ensure that it is the first volume of file-set-ID (see the format for MOUNT command lines for magnetic tapes). If you do not specify the /VOL keyword, the system does not check the Volume ID for the tape.

For compatibility with previous RSX-11M/M-PLUS releases, the command line

```
>MOU MM:(A,B,C)
```

is equivalent to the command line

```
>MOU MM:A /VOL=(A,B,C)
```

/[NO]WAIT

Specifies whether you require operator assistance in performing the mount. The main use of this keyword is for batch jobs, indirect command files, or terminals distant from the machine room.

If you specify /WAIT in an interactive mount, a message concerning the mount is sent to the operator's console and the mount is not completed until the operator takes action.

If you specify /NOWAIT in a batch job or indirect command file, or if the mount is interactive, no message appears. The volume must have been previously placed on the device and readied for access (spun up/brought on-line).

Default: /NOWAIT.

MOU (Cont.)

/WIN=option

Specifies the number of mapping pointers to be allocated for file windows. A file window consists of a number of mapping pointers and is stored in memory when the file is opened. (See the IAS/RSX-11 I/O Operations Reference Manual for a description of retrieval pointers.) The number of retrieval pointers must be less than 129(10).

/WIN accepts the following options:

n	All files are set up with this default unless overridden on access; legal values are 1 through 127(10) or the FULL option.
USER:n	User default value for the volume.
INDEX:n	Number of pointers to allocate to the index file window
(USER:n,INDEX:n)	If n is not the same for both of these, defaults to the user default value for the volume default and to the number specified for the index file
FULL	Windows are created that map as much of the file as possible; FULL can be used for n in all of these options.

Default: The number of pointers specified in the home block with either the INI or HOME command.

/[NO]WRITE

/WRITE specifies that write operations are allowed on the volume (the volume is software write-enabled) within the limits of volume and file protection.

/NOWRITE specifies that write operations are not allowed on the volume (the volume is software write-locked).

Default: Write operations are allowed.

Examples:

```
>MOU DM1:AMBER
```

Mounts the volume on device unit DM1:. (In this example, the optional parameters have not been specified. Therefore, MOUNT uses the parameter values in the volume's home block.) No volume information is displayed.

MOU (Cont.)

```
>MOU (MT0:,MT1:,MT2:)MYSET /VOL=(VOL1,VOL2,VOL3)
```

Mounts the volume set MYSET on units MT0:, MT1:, and MT2:. Initially, VOL1 must be physically loaded on MT0:; the first volume in a set must always be loaded on the first unit specified in the command. VOL2 and VOL3 may or may not be loaded when the command line is issued. If they are loaded, they can reside on the remaining units in any order (for example, VOL3 could be loaded on MT1:).

The system searches for the next volume in a set by Volume ID rather than by unit number; the order in which volumes are listed in the command line is the order in which the system searches for and/or requests the volumes. If VOL2 and VOL3 are not loaded, the system requests each in turn. The volumes can be loaded on either MT0:, MT1:, or MT2:.

```
>MOU DM1:SYS004/LRU=9/VI/WIN=20
```

Mounts the volume labeled SYS004 on DM1:. The command line reserves space for nine directory File Control Blocks (FCBs) to remain in the ACP's pool or system pool, displays the volume information, and changes the default window block size for files opened on this volume to 20(10).

Command Error Messages:

See the IAS/RSX-11 I/O Operations Reference Manual for definitions of the I/O error codes.

```
MOU -- AMBIGUOUS KEYWORD
<command-line>
```

The abbreviation used for a keyword in the command line was too short for MOUNT to distinguish it from another keyword. Reenter the command line, using a longer form of the keyword.

```
MOU -- COMMAND INPUT ERROR
<I/O error code and text>
```

An error occurred while MOUNT was attempting to read the command line. Correct the error condition listed and reenter the command line.

```
MOU -- COMMAND SYNTAX ERROR
<command-line>
```

The command line is not in the proper format. The incorrect part of the command line is enclosed in brackets. Reenter the command line, using the correct syntax.

```
MOU -- DEVICE DRIVER NOT LOADED
```

The device driver for the specified device is not loaded. Load the device driver, using the LOAD command, and reenter the command line.

MOU (Cont.)

MOU -- DEVICE NOT MOUNTABLE

The specified device cannot be mounted. Some devices do not require mounting although the media are removable. Verify that you are using the correct device and reenter the command line if necessary.

MOU -- DEVICE NOT READY

The specified device returned a device-not-ready status or failed to respond within approximately 60 seconds. Verify that you are using the correct device, ready the device, and reenter the command line.

MOU -- DEVICE STATUS CHANGED DURING MOUNT

The device status for the specified device changed between the initial device classification and the final setting up of the data structures. This is usually the result of another user mounting or dismounting the volume simultaneously with the command in error. Verify the device status and reenter the command line.

MOU -- FAILED TO ALLOCATE SUFFICIENT DYNAMIC STORAGE

Mounting a volume may require a significant amount of primary or secondary pool for data structures and the ACP. Either MOUNT or the ACP was unable to allocate enough space in pool. Wait until activity on the system has lessened and then reenter the command line.

MOU -- FAILED TO SET VOLUME VALID BIT
<I/O error code and text>

(RSX-11M-PLUS systems only.) A hardware volume valid bit is maintained by certain hardware. When the attempt was made to set this hardware status bit, the driver returned an error. Correct the hardware problem and reenter the command line.

MOU -- FAILED TO START ANCILLARY CONTROL PROCESSOR

The Executive was unable to start the ACP task. The task may be exiting or there may not be sufficient resources. Reenter the command line at a later time.

MOU -- F11MSG NOT INSTALLED

The task F11MSG is not installed. Ask your system manager to install it.

MOU -- I/O ERROR ON DEVICE
<I/O error code and text>

An I/O error occurred in the file system software while accessing the device. The line enclosed in brackets contains the specific error code returned by the system or the device driver. Correct the error condition and reenter the command line.

MOU (Cont.)

MOU -- INCOMPATIBLE DEVICES FOR MULTI-VOLUME SET

The specified devices are incompatible in one or more of the following ways:

1. All must be either disk or magnetic tape devices.
2. All must be either public, allocated, or not allocated.
3. If magnetic tapes, all must support either 7-track or 9-track and all must support a common density.

Verify the device specifications and reenter the command line.

MOU -- INCORRECT FILE SET IDENTIFIER

The File Set ID specified in the command line does not match that in the File Set ID field of the HDR1 label. Determine the correct File Set ID and reenter the command line, or reenter the command line specifying the /OVRFSID keyword.

MOU -- INCORRECT VOLUME IDENTIFIER

The Volume ID specified in the command line does not match that in the Volume ID field of the VOL1 label. Determine the correct Volume ID and reenter the command line, or reenter the command line without specifying any Volume ID.

MOU -- INCORRECT VOLUME LABEL

The volume label specified in the command line does not match the volume label in the home block. Determine the correct volume label and reenter the command line, or mount the volume specifying the /OVR keyword.

MOU -- INSUFFICIENT PRIVILEGE FOR ATTEMPTED OPERATION

An option specified in the command line requires that the user be privileged.

MOU -- INTERNAL LOGIC ERROR

An internal programming error has been detected. This may be the result of an unusual software or hardware configuration or option selection. Retry the operation. If the error persists, vary the options selected. In any case, submit a Software Performance Report (SPR) with a console listing of the command lines and error messages and as much information on the circumstances of the error as possible.

MOU -- MAGTAPE IS NOT SHAREABLE, DEVICE IN USE

The specified device is already mounted, or the command line requested shared or public access to the device. Magnetic tapes are sequential devices and are processed sequentially. Only one user can access a tape at one time. Reenter the command line, specifying the /NOSHARE keyword.

MOU (Cont.)

MOU -- MOUNT IS NOT NECESSARY FOR CASSETTES

Self-explanatory. This is an informational message only.

MOU -- MOUNT NOT SUPPORTED FOR DEVICE CLASS

Although the specified device is mountable, MOUNT is unable to process the command line for this class of device. MOUNT supports only Files-11 random-access devices and labeled (ANSI) and unlabeled sequential tape devices. MOUNT does not support communications class devices such as DECdataway or DECnet.

MOU -- MULTI-VOLUME DISK NOT SUPPORTED

MOUNT only supports multivolume ANSI magnetic tape sets.

MOU -- NO HOME BLOCK FOUND OR STRUCTURE NOT SUPPORTED

F11ACP was unable to locate a valid home block on the volume. The volume is either uninitialized, corrupted, or in an unsupported format such as Files-11 Structure Level 2 or RT-11. (Certain utilities such as FLX support other formats such as DOS-11 and RT-11.) These volumes must be mounted with the /FOR keyword.

MOU -- NO SUCH DEVICE AVAILABLE

The specified device name and unit was not found in the logical or physical device tables. Determine the correct device name and unit number and reenter the command line.

MOU -- NOT FIRST VOLUME OF TAPE SET

Tape sets must be read from the first volume. The first tape volume of the tape set was not loaded on the first tape drive specified in the command line.

MOU -- OPERATION INVALID TO SPOOLED DEVICE

The specified device has been redirected to an intermediate device for spooling. Generally, only unit record devices are spooled and are usually not mountable. If the device is mountable, the queue spooler processor servicing the device must be stopped and the device unspooled.

MOU -- PARAMETER CONFLICT WITH ALREADY MOUNTED VOLUME

The volume was already mounted foreign and Files-11 access was requested or the volume was mounted Files-11 and foreign access was requested.

MOU -- REQUESTED DENSITY NOT AVAILABLE

The density specified in the command line is not supported by the specified devices. Either specify the correct density or select hardware that supports the desired density.

MOU -- TAPE NOT ANSI OR INCORRECT TAPE FORMAT

The tape labels did not conform to the ANSI standard or the tape is not an ANSI labeled tape. Specify other tape formats with the /NOLABEL and /FOR keywords.

MOU -- UNIT ALLOCATED TO OR IN USE BY ANOTHER USER

Another user has allocated the device or a task has the unit attached. Verify that the volume is loaded in the correct unit, that the correct unit is specified, and that no other user has allocated the device.

MOU -- UNIT OFFLINE

(RSX-11M systems only.) The specified device unit was not on line when the system was booted. Select another unit or, if the unit is now available, reboot the system and reenter the command line.

(RSX-11M-PLUS systems only.) The specified device unit was not on line or was in use for privileged diagnostic operations. Select another unit or, if the unit is now available, place the device on line with the reconfiguration services. Reenter the command line. (See the RSX-11M/M-PLUS System Management Guide for information on the reconfiguration services.)

MOU -- UNIT SPECIFIED MORE THAN ONCE IN MULTI-VOLUME SET

A device can only be specified once for a multivolume tape set.

MOU -- UNRECOVERED DEVICE ERROR

After the standard number of retries, the I/O operation still could not be successfully completed. This error message usually indicates an error in the media. Correct the problem and reenter the command line.

MOU -- VOLUME ALREADY MOUNTED

The volume is already mounted as nonshareable or is a public volume and cannot be mounted a second time.

Mounted Magnetic Tape Messages

Messages that begin with xxxxxx are from the Ancillary Control Processor (ACP) that is servicing your ANSI magnetic tape volume. The messages are generated by volume-switching operations for multivolume tape sets.

A message first appears on the console terminal. If no action is taken before a timeout interval elapses, the message appears again on the console terminal and on the terminal that issued the command line.

MOU (Cont.)

These messages do not occur during the execution of the MOUNT command, but rather as a result of operations performed by a system utility or user application program.

xxxxxx -- EXPIRATION DATE NOT REACHED ON VOLUME volume-id ON ddnn:
MOUNT ANOTHER VOLUME ON DRIVE ddnn: OR PLACE ON-LINE TO USE

A new output volume is being opened and the expiration date has not been reached. A new volume can be placed on line, in which case its expiration date is also checked. If the same volume or another volume with the same Volume ID is placed on line, the volume is overwritten even though it is not expired.

This message occurs only on volume switching. If a program is creating a file and specifies the file position of a file whose expiration date has not been reached, the create operation terminates with IE.EXP.

xxxxxx -- MOUNT NEXT VOLUME ON DRIVE ddnn:

The ACP does not know the name of the next volume in the tape set. The next volume must be placed on the drive specified. When this message appears, the action to be taken depends on whether a program is currently reading or writing the set as follows:

1. When writing, the ACP accepts any tape that has been properly initialized. The expiration date of the first file on the tape is checked to verify overwrite access. If the write-ring is missing when the tape is placed on line, the program writing to the tape will receive an error message.

2. When reading, the next volume of the current volume set must be placed on the drive specified in the message. The Volume ID is not checked, but other consistency checks are made, depending on the type of read operation currently in progress.

xxxxxx -- MOUNT volume-id ON DRIVE ddnn:

Place the volume specified in the message on the drive indicated. The ACP knows the name of the volume because either multiple Volume IDs were specified in the command line or the ACP has already processed (and therefore remembers) the Volume ID while the tape set has been mounted.

xxxxxx -- PLACE DRIVE ddnn: ON-LINE

The next device drive requested in a multivolume, multiunit operation is off line.

xxxxxx -- REQUESTED ACTION FOR DRIVE ddnn: NOT COMPLETED

This is a reminder message. It indicates that a condition reported in a previous message from xxxxxx has not yet been taken care of.

MOU (Cont.)

xxxxxx -- REQUESTED ACTION FOR TASK taskname ON DRIVE
ddnn: NOT COMPLETED/PLEASE COMPLETE OR ABORT TASK

This is a reminder message. It is displayed after a long delay.

xxxxxx -- WRONG VOLUME MOUNTED ON DRIVE ddnn:

A subsequent volume of a multivolume tape set has been placed on line, but the ACP does not think it is the correct volume. This condition can occur for the following reasons:

1. The MOUNT command line specified explicit volume IDs and the volume that should be mounted is not the one on the drive.

2. The ACP has learned the volume sequence of the current tape set because of previous processing while the set has been mounted and the volume that should be mounted is not the one on the drive.

3. The volume on the drive is not in ANSI format.

4. A hardware error prevented the ACP from reading any of the labels in the label set at the beginning of the volume.

5. Some other inconsistency in the volume label set has been encountered.

OPE

OPENREGISTER (P)

The OPENREGISTER command allows examination and optional modification of a word of memory. To open a location within a task, the task must be fixed in memory.

By default, OPEN displays a location and its contents in octal. Special control characters allow you to also have the information displayed in ASCII, Radix-50, double-byte, or decimal format. To specify a different format, type the desired control character followed by the ESCape key. You can do multiple conversions for the same location on one line. The display remains on the same line until you open the next location.

You use the same control characters to insert new values into a location in ASCII, Radix-50, double-byte, or decimal format. In this case, type the desired control character followed by the new value and then press the RETURN key to insert the new value and open the next location.

Format:

```
OPE[N] memory-address [+ or - n][/keyword]

memory-address /contents [control-character][value]line-terminator
```

The first line is the OPEN command line. The second line is the general format in which OPEN displays the contents of the location. After that, you can display and change the contents in various formats.

memory-address

A 1- to 8-digit octal memory address (location).

+ or - n

One or more optional octal numbers to be added to or subtracted from the memory address.

/keyword

One of the keywords defined later in this text. The keywords apply only to mapped systems.

control-character

One or more optional special characters used to display values or insert new values in octal, ASCII, single-character ASCII, Radix-50, double-byte, or decimal format. The special characters and their related formats are:

```
/ - octal (default format)
" - ASCII
' - single-character ASCII
% - Radix-50
\ - double-byte
. - decimal
```

OPE (Cont.)

line-terminator

The line terminator directs the subsequent action of OPEN. Any value that is entered replaces the contents of the word whose address and current value are shown in the first part of the display line. The slash (/) is part of the display line.

(ESC)

ESCape or ALTMODE: ESC (ALTMODE) terminates acceptance of further input and is the only exit from the OPEN command. If used after a special control character, it converts the contents of a location from octal to the desired format.

(RET)

RETURN: the next sequential location is opened. If used after a special control character and new value sequence, it inserts the new value in the specified format into a location.

^(RET)

Circumflex (up-arrow on some terminals)/RETURN: the previous location is opened.

*(RET) or @(RET)

Asterisk/RETURN or at sign/RETURN: the location pointed to by the contents of the opened location is opened.

>(RET)

Right-angle bracket/RETURN: the contents of the open location is treated as a branch instruction. The effective address of the branch is the next opened location. You cannot supply a value (modify the current open location) and close the location with a right-angle bracket/RETURN.

Keywords:

/AFF=[CPx,UBy]

(RSX-11M-PLUS multiprocessor systems only.) Accesses an address relative to the specified processor's I/O page. The square brackets are required syntax.

/CPU=CPx

(RSX-11M-PLUS multiprocessor systems only.) Accesses an address relative to the specified CPU partition.

/DRV=dd:

Accesses an address relative to the beginning of the partition that contains the loadable driver for the specified device.

OPE (Cont.)

/KNL

Accesses the first 32K of Executive memory.

In an RSX-11M-PLUS system supporting instruction space (I-space) and data space (D-space), the keyword accesses and prints the contents of addresses in the Executive data space. On non-I and D-space systems, the keyword accesses and prints the contents of addresses in the Executive instruction space.

/KNLD

(RSX-11M-PLUS systems only.) Accesses and prints the contents of addresses in the Executive data space. (Valid only in systems that support I- and D-space.)

/KNLI

(RSX-11M-PLUS systems only.) Accesses and prints the contents of addresses in the Executive instruction space. (Valid only in systems that support I- and D-space.)

/PAR=partition-name

(RSX-11M systems only.) Accesses an address relative to the beginning of the specified partition.

/REG=region-name

(RSX-11M-PLUS systems only.) Accesses an address relative to the beginning of the specified region.

/TASK=taskname

Accesses an address relative to the specified task (the task partition). Note that the task must be fixed.

In an RSX-11M-PLUS system supporting user I- and D-space, the keyword accesses and prints the contents of addresses in the user data space.

/TASKD

(RSX-11M-PLUS systems only.) Accesses and prints the contents of addresses in the data space of an I- and D-space task. Note that the task must be fixed. (Valid only in systems that support user I- and D-space.)

/TASKI

(RSX-11M-PLUS systems only.) Accesses and prints the contents of addresses in the instruction space of an I- and D-space task. Note that the task must be fixed. (Valid only in systems that support user I- and D-space.)

OPE (Cont.)

After accepting the first input line, OPEN finds the memory location to be accessed by using either:

- The keyword (in a mapped system)
- The specified address as the actual address

When /DRV, /PAR, /REG, and /TASK are used, the supplied memory address (a virtual address in the partition) is modified by + or - n. The absolute address thus formed is used to display the second line shown in the command format. In particular, the virtual address (task, partition, or kernel) and its contents are displayed. You may then enter an optional replacement value, followed by a line terminator.

On mapped RSX-11M systems, an attempt to specify an illegal location or access beyond the limits of the partition causes an error message. You are limited to the specified memory region (TASK, PAR, or DRV). However, if you do not use a keyword in the command line, OPEN can access any address of physical memory. On unmapped RSX-11M systems, any location in physical memory can be accessed.

OPE (Cont.)

On RSX-11M-PLUS systems, an attempt to specify an illegal location or access beyond the limits of the partition causes an error message. You are limited to the specified memory region (TASK, REG, or PAR). However, if you do not use a keyword in the command line, OPEN can access any address of physical memory. On multiprocessing systems, to access an address in a device page (the processor's I/O page), you must treat the location as absolute and use the /APT keyword. Likewise, to access an address in a CPU partition, you must treat the location as absolute and use the /CPU keyword.

Examples:

```
>OPE 4+10/TASK=CYCLE
000014 /60014 350 ESC
```

In this RSX-11M-PLUS example, the specified virtual address in the task CYCLE is 4 while n equals 10, yielding the effective task-relative address of 000014. The system responds by printing the virtual address (000014) and the contents of the address (060014), followed by the slash. The operator responds by entering the new value 350 and the ESCape character. The value 350 replaces the previous contents of the task's virtual location 000014.

```
>OPE 0/PAR=TSTPAR
00000000/50712
```

This command opens the partition TSTPAR at location 0 and displays in octal the current value at the location.

```
>OPE 0/PAR=TSTPAR
00000000/50712 ^ ESC MCR
```

This command opens location 0 of TSTPAR, displays the current value in octal, and then displays the Radix-50 value in ASCII format.

```
>OPE 0/PAR=TSTPAR
00000000/50712 ^ ESC MCR ^DCL RET
00000002/00000 RET
00000000/14604
```

This command sequence displays the current value at location 0 in octal and then Radix-50 format, and then changes the value. The new value is also in Radix-50 format. Pressing the RETURN key enters the new value into location 0 and displays it in octal, opens the next location in memory, and displays its contents in octal.

Command Error Messages:

OPE -- BYTE ADDRESS

The address specified as the argument to the OPEN command was an odd address.

An even address (for example, 3000) is legal. An odd address (for example, 3001) is illegal.

OPE (Cont.)

OPE -- INPUT I/O ERROR

In attempting to read the next command, OPEN detected an error.

OPE -- INVALID ADDRESS

The address specified as an argument by the OPEN command referenced a nonexistent memory location, an address outside of the specified partition, or an address outside of the task's virtual address space.

OPE -- TASK NOT FIXED

An attempt was made to open a virtual location in a task. Since the task was not fixed, it may or may not have been in memory when you issued the OPEN command. This message indicates that the task was not in memory.

PAR

PARTITION DEFINITIONS (NP)

The PAR command displays a description of each memory partition in the system.

On RSX-11M systems, the display consists of six columns that specify:

1. Partition name
2. Address of Partition Control Block (PCB)
3. Starting address of partition (octal)
4. Size of partition (octal)
5. Partition kind: main partition (MAIN) or subpartition (SUB)
6. Partition type:

TASK	User-controlled
COM	Common
DEV	Device registers
SYS	System-controlled
taskname	Task region
DYNAMIC	Dynamically created region
DRIVER	Region occupied by a loadable driver

COM partitions are used for resident libraries and common data areas. DEV partitions are used to allow tasks to communicate with specific device registers, such as the UDC and ICS/ICR-11 industrial control subsystems. See Chapter 2 for a description of system and user-controlled partitions as well as subpartitions. Dynamic and task regions are defined in the RSX-11M/M-PLUS Executive Reference Manual. See the description of the LOAD command for information about loadable drivers.

On RSX-11M-PLUS systems, the display consists of six columns that specify:

1. Partition name
2. Address of Partition Control Block (PCB)
3. Starting address of partition (octal)
4. Size of partition (octal)
5. Partition type:

MAIN	Main partition
TASK	Partition contains a task
DRIVER	Partition contains a device driver
RO COM	Partition is a read-only common
RW COM	Partition is a read/write common
DEVICE	Partition is a common and is mapped to the I/O page
SEC POOL	Partition is in secondary pool
CPU	Partition is a CPU partition in a multiprocessor system

PAR (Cont.)

6. Description of partition occupant in the form:	
[taskname]	An inactive resident task
< taskname >	An active task
(dd:)	The specific device driver
+ xxxx +	The name of the first installed task that is associated with an unnamed common, usually the read-only segment of a multiuser task
! xxxx !	The name of the common

Format:

PAR[TITIONS]

Examples:

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```
>PAR
TTPAR  114670 00120000 00040000 MAIN TASK
EXCOM1 114624 00160000 00014500 MAIN COM
EXCOM2 114560 00174500 00006100 MAIN COM
SYSPAR 114514 00202600 00010000 MAIN TASK
TKNPAR 114450 00212600 00010000 MAIN TASK
DRVPAR 114404 00222600 00030300 MAIN SYS
       114340 00222600 00002100 SUB  DRIVER -DB:
       114240 00224700 00001200 SUB  DRIVER -DK:
       114140 00226100 00003100 SUB  DRIVER -DM:
       114040 00231200 00003000 SUB  DRIVER -DR:
       113240 00245000 00001300 SUB  DRIVER -LP:
       113104 00246300 00004300 SUB  DRIVER -MM:
       112450 00252600 00000300 SUB  DRIVER -CO:
LDRPAR 112404 00253100 00002500 MAIN TASK
BASIC2 112340 00255600 00040000 MAIN COM
FCSRES 112274 00315600 00040000 MAIN COM
TSTPAR 112230 00355600 00100000 MAIN TASK
GEN    112164 00455600 03322200 MAIN SYS
       045214 00455600 00006200 SUB  (PMT...)
       072740 01151100 00035600 SUB  (DCLT5 )
       074670 01206700 00020300 SUB  (...MCR)
       072240 01242600 00037600 SUB  (...HEL)
       102350 01302400 00132300 SUB  (...PIP)
       074624 01472500 00131300 SUB  (...EDT)
       074334 01714100 00057100 SUB  (TT13  )
       063724 01773200 00060000 SUB  (AT.T51)
```

PAR (Cont.)

RSX-11M-PLUS systems

```
        >PAR
        SYSPAR 117734 00174400 00010000 MAIN
        065230 00174400 00010000 TASK   <TKTN  >
SPLPAR  117767 00204400 00012000 MAIN
DRVPAR  117624 00216400 00140000 MAIN
        117340 00216400 00003100 DRIVER (DB:)
        117274 00221500 00001300 DRIVER (DK:)
        117164 00226100 00001300 DRIVER (DS:)
        117120 00227400 00004000 DRIVER (DM:)
        036314 00233400 00001600 DRIVER (DX:)
        116744 00236400 00001100 DRIVER (LP:)
        116700 00237500 00003600 DRIVER (MM:)
        116634 00243300 00035300 RW COM !TTCOM !
        116550 00300600 00015600 DRIVER (TT:)
        116504 00316400 00001300 DRIVER (RD:)
        116440 00317700 00001300 DRIVER (VT:)
        116374 00321200 00000100 DRIVER (NL:)
        036044 00321300 00001300 DRIVER (DT:)
        036504 00322600 00003200 DRIVER (DR:)
LDRPAR  117560 00356400 00002600 MAIN
        116054 00356400 00002600 TASK   <...LDR>
TSTPAR  117514 00361200 00040000 MAIN
SECPOL  117450 00421200 00022000 SEC POOL
GEN     117404 00443200 04734600 MAIN
        115454 00443200 00070600 TASK   <F11ACP>
        073400 00534000 00006000 TASK   <TT36  >
        052274 00542600 00003500 RO COM +...EDI+
        060774 00571400 00020100 TASK   <QMG...>
        037210 00620100 00036100 TASK   <HRC...>
        045104 00656200 00026400 TASK   <RMDEMO>
        040240 00716200 00070600 TASK   <DS00F1>
        043300 01007300 00070600 TASK   <DS01F1>
        044474 01077600 00070600 TASK   <LSTACP>
        062254 01170400 00040000 TASK   <SYSLOG>
        061340 01230400 00012100 TASK   <LPPO  >
        061674 01242500 00012100 TASK   <LPP1  >
        061774 01254600 00037100 TASK   <BAP2  >
        063050 01313700 00037100 TASK   <BAP1  >
        070100 01401400 00035400 TASK   <AT.T36>
        071114 01437000 00035400 TASK   <AT.V3 >
        037474 01474400 00074500 TASK   <EDTT3 >
        072244 01571100 00026500 TASK   <PARV3 >
        042100 01631100 00064500 TASK   <TT47  >
        037540 01715600 00102700 TASK   <EDIT25>
        064534 02050500 00033500 TASK   <TTF6  >
        037724 02143000 00134300 RW COM !RMSRES!
        070574 02340500 00041700 TASK   <LOGT17>
```

REA

REASSIGN (P)

The REASSIGN command reassigns a task's Logical Unit Numbers (LUNs) from one physical device unit to another. The reassignments affect only the static assignments recorded in the task's image file on disk.

The command does not affect a memory-resident task. Hence, REASSIGN has no effect on the assignments of a currently executing task nor on those of a task that is fixed in memory.

Format:

REA[SSIGN] taskname lun ddnn:

taskname

The name of the task.

lun

The Logical Unit Number of the task.

ddnn:

The new device unit, which can be a physical, logical, or pseudo device.

Examples:

>REA TSK1 3 TT0:

Reassigns LUN 3 of task TSK1 to device TT0:.

>REA GNRL 2 TT1:

Reassigns LUN 2 of task GNRL to device TT1:.

>REA TEST 3 XX:

Reassigns LUN 3 of task TEST to logical device XX:.

Command Error Message:

REA -- LUN OUT OF RANGE

An attempt was made to reassign a LUN that was greater than the maximum number of LUNs allocated to the task when it was built.

RED

REDIRECT (P)

The REDIRECT command redirects all I/O requests previously directed to one physical device unit to another physical device unit. The REDIRECT command is especially useful if I/O units required for a task are not working. The command does not affect any I/O requests already in the I/O queue.

You cannot redirect the following device units:

- The pseudo device TI: (nor can a device be redirected to TI:)
- An attached device
- A device unit containing a mounted volume
- A spooled device (RSX-11M-PLUS)

In addition, you cannot redirect a pseudo device to itself, nor can you redirect a terminal to the null device.

You can redirect a logged-in terminal to a device other than a terminal (except for the null device), but it is not generally advisable to do so because terminal I/O would be written to the device and that could destroy the boot block. If you do redirect a terminal to another type of device, you should redirect the terminal to itself before you log out.

Format:

RED[IRECT] nddnn:=oddnn:

nddnn:

The new device unit to which subsequent requests will be directed.

oddnn:

The old device unit from which requests have been redirected.

Example:

>RED TT3:=TT6:

Redirects all I/O requests for device TT6: to device TT3:. (RED TT6:=TT6: restores I/O requests for TT6:.)

Command Error Messages:

RED -- CIRCULAR REDIRECT ERROR

The attempt to redirect a device would result in a circular list of redirections.

RED -- DEVICE NOT REDIRECTABLE

An attempt was made to redirect a device that cannot be redirected.

RED (Cont.)

RED -- NEW DEVICE NOT KNOWN TO SYSTEM

The new device specified by the REDIRECT command was not known to the system (did not exist in the device tables).

RED -- OLD DEVICE ATTACHED

An attempt was made to redirect an attached device.

RED -- OLD DEVICE MOUNTED

An attempt was made to redirect a mounted device.

RED -- OLD DEVICE NOT KNOWN TO SYSTEM

An attempt was made to redirect an unknown device (the device did not exist in the device tables).

RED -- PSEUDO DEVICE REDIRECT ERROR

An attempt was made to redirect one pseudo device to another pseudo device.

RED -- TI REDIRECT ERROR

An attempt was made to redirect the pseudo device TI:. This device cannot be redirected.

RED -- TT REDIRECT ERROR

An attempt was made to redirect a terminal to the null device. This combination is not allowed.

REM

REMOVE (P)

The REMOVE command deletes an entry (a task name) from the System Task Directory (STD) and thereby removes the task from the system. The removal of a task from the system makes the task unknown to the system. This action is the complement of INSTALL. All that remains of the task in the system is the task image file.

REMOVE also checks to see if the task is an initialized CLI. If so, REMOVE issues an error message.

To remove a task that is currently executing, you must first abort the task.

Format:

REM[OVE] [ddnn:] taskname

ddnn:

The device from which the task was installed.

taskname

The name of the task to be removed.

On RSX-11M-PLUS systems, the REMOVE command accepts a keyword that allows users to remove regions from the Common Block Directory (CBD). The format is:

REM region-name /REG

Example:

>REM SCAN

Removes the task named SCAN from the system. The task image file is not deleted.

Notes:

- If a task that is the object of a REMOVE command is fixed, the command unfixes the task and then removes it.
- REMOVE cancels all time-based schedule requests for the specified task.
- REMOVE unlinks a task from all ICS/ICR interrupts.
- REMOVE deallocates all receive-by-reference and receive-data packets for the task and detaches all attached regions. (See the RSX-11M/M-PLUS Executive Reference Manual.)

Command Error Message:

REM -- CLI IN USE

An attempt was made to remove a CLI that was still active. Before a CLI can be removed, its CPB must be eliminated with the CLI command.

RES

RESUME (NP,P)

The RESUME command continues execution of a previously suspended task.

A nonprivileged user can issue the RESUME command only for tasks initiated from the issuing terminal. A privileged user can direct the RESUME command to any suspended task.

Format:

RES[UME] taskname [/TERM=TTnnn:]

taskname

The name of the task to be resumed.

/TERM=TTnnn:

(RSX-11M-PLUS systems only.) A privileged keyword that resumes a task initiated from the specified terminal.

Example:

>RES RX7

Resumes task RX7.

Note:

A task cannot suspend any task other than itself. The RESUME command allows such a suspended task to proceed.

Command Error Message:

RES -- TASK NOT SUSPENDED

The task specified in the RESUME command line was not suspended.

RUN

RUN (NP,P)

The RUN command initiates the execution of a task. The command can cause a task to be:

- Run immediately (NP)
- Run at a time increment from now (P)
- Run at a time increment from clock unit synchronization (P)
- Run at an absolute time of day (P)
- Installed, immediately run, and removed on exit (NP)

All of these options, except install-run-and-remove, are available with or without rescheduling.

On RSX-11M-PLUS, you cannot run a task using the ...xxx form of the task name, that is, you cannot specify RUN ...xxx. The ...xxx (andxxx$$$) form is used for the prototype copy of the task, which is never executed.

Formats:

RUN has five format variations.

1. Run immediately (nonprivileged option).

```
RUN taskname [/UIC=[g,m]]
```

taskname

A 1- to 6-character task name.

/UIC

(Privileged option on multiuser systems only.) The UIC under which the task will be requested to run. This UIC also determines which files the task can access.

The UIC has the format [g,m], where g and m represent the group and member numbers, respectively. Legal group and member numbers range from 1 through 377(8). The square brackets are required syntax.

When you use /UIC, RUN locates the task image file in the specified UIC (on device SY:) and runs the task from that UIC. The specified UIC also becomes the default and protection UICs for the task.

When you do not use /UIC, RUN looks for the task image file in the System Task Directory (STD) to see if the task is already installed. If RUN finds the task, it proceeds to run it. If RUN does not find the task, it looks for the file in the UIC (on device SY:) to which the terminal requesting the task is set, and then installs and runs the task. The terminal's UIC becomes the default and protection UICs for the task.

RUN (Cont.)

Note that on mapped systems, you can request a task to run that is not in the STD. MCR invokes a catchall task to install and run the uninstalled task. See the RSX-11M/RSX-11S or RSX-11M-PLUS Release Notes for information about the catchall task.

See the description of /UIC under Format 5 for its use by nonprivileged users and tasks.

Default: the UIC of the terminal that issued the RUN command (/UIC is not specified).

2. Run at a time increment from now (privileged option).

RUN taskname dtime [/RSI=magu][/UIC=[g,m]]

taskname

A 1- to 6-character task name.

dtime

The time at which the task will be initiated in time units from command issuance. This time parameter consists of two fields: a magnitude field and a units field. The parameter is in the form magu where mag is the magnitude and u is one of the following time units: T, S, M, or H.

The magnitude is the number of units to be clocked. It cannot exceed 24 hours in the specified unit and is decimal by default.

The unit fields are T, S, M, and H:

T

Ticks. A tick is a clock interrupt. The rate at which interrupts occur depends on the type of clock installed in the system. For a line frequency clock, the tick rate is either 50 or 60 per second, depending on the line frequency. For a programmable clock, a maximum of 1000 ticks per second is available. The frequency is selected at system generation.

T can be any positive value from 0 through a maximum length of 15 bits.

S

Seconds. S can be any positive value from 0 through a maximum length of 15 bits.

M

Minutes. M can be any positive value from 0 through 1440(10).

RUN (Cont.)

H

Hours. H can be any positive value from 0 through 24(10).

/RSI

The reschedule interval. The format is the same as for dtime. The reschedule interval specifies how often the task is to be rerun. Thus, each time the specified interval of time lapses, an initiation request is made for the specified task.

If the magnitude is equal to 0, then the reschedule interval is set to 1. Specifying /RSI=0H is the same as specifying /RSI=1H.

Note that the CANCEL and REMOVE commands negate the effect of this keyword.

Default: no rescheduling.

/UIC

See Format 1.

3. Run at a time increment from clock unit synchronization (privileged option).

The system determines the task start-time by waiting for the first specified time unit (hour, minute, second, tick) to increment and then waiting for the specified time to elapse.

RUN taskname sync [dtime][/RSI=magu][UIC=[uic]]

taskname

A 1- to 6-character task name.

sync

H - Synchronize on the next hour
M - Synchronize on the next minute
S - Synchronize on the next second
T - Synchronize on the next tick

dtime

See Format 2. If present, dtime is added to the synchronization unit to produce the actual run time for running the task.

/RSI

See Format 2.

/UIC

See Format 1.

RUN (Cont.)

4. Run at an absolute time of day (privileged option).

   RUN taskname atime [/RSI=magu][/UIC=[uic]]

   taskname

   A 1- to 6-character task name.

   atime

   Absolute time of day at which to initiate this task. Input format is hh:mm:ss.

   hh - Hours (decimal assumed)
   mm - Minutes (decimal assumed)
   ss - Seconds (decimal assumed)

   /RSI

   See Format 2.

   /UIC

   See Format 1.

5. Install, run immediately, and remove on exit.

   RUN [ddnn:][$]filename [/keyword(s)]

   ddnn:

   The device unit on which the task image file resides.

   $

   Specifies that the file can be found in the System Task Directory on device LB: (if ddnn: is not specified).

   The SET /SYSUIC command defines the system directory. By convention, the directory is [1,50] on an unmapped system and [1,54] on a mapped system.

   If you do not specify $, RUN searches for the task image file in the UIC (on device SY:) to which the terminal requesting the task is set. (This is similar to Format 1 when /UIC is not specified.)

   On RSX-11M-PLUS systems, if you specify $ and the task image file cannot be found in the system directory, RUN searches the library directory on device LB:. By convention, LIBUIC is [3,54].

   Note that if LB: has been reassigned to another device and that device's system UIC contains privileged tasks built for another system, your system will crash.

RUN (Cont.)

filename

The name of the task image file to be run.

Keywords:

/CKP=option

Specifies whether or not a task will be checkpointable. The options are YES and NO. If you specify /CKP=YES (default for checkpointable tasks), checkpointing is allowed. If you specify /CKP=NO, checkpointing is disabled for the task.

The /CKP keyword overrides the /CP switch specified at task build.

On systems that support the dynamic allocation of checkpoint space, the task image file does not need to contain allocated checkpoint space. The presence of the /CKP=YES keyword instructs the system to allocate checkpoint space for the task when required from a checkpoint file.

/CMD="command-line"

Passes the specified command line to the task for processing. The command line must begin with the task's acronym and it must be valid for the task (for example, if the task being installed is MAC, "command-line" must be a valid MACRO-11 command line) or a syntax error will occur. When the task has finished executing the command line, the task is removed.

/EST=option

Specifies whether or not a task will wait for spawned tasks to complete and for RUN to emit exit status. The options are YES and NO. If you specify /EST=YES, the parent task waits for any task it spawns to complete and for RUN to emit exit status before continuing. If you specify /EST=NO, the parent task does not wait for exit status from RUN; as soon as the spawned task begins running, the parent task continues executing.

Default: /EST=YES; parent tasks do not continue until RUN emits exit status.

/INC=size

Increments the address space allocated to a task that runs in a system-controlled partition. The variable size is the number of additional words of address space to allocate. The increment is usually expressed in octal, but can also be expressed in decimal by appending a period.

RUN (Cont.)

This keyword overrides the EXTT3K or PAR option used at task-build time. Tasks that specify the size of the partition in which they are running use this keyword to identify how much dynamic space they may allocate to symbol tables or buffers. Tasks such as MAC, TKB, VFY, and AT. use the space from the end of the task image to the end of their address space as dynamic memory. In effect, the /INC keyword defines the number of words in this dynamic region.

On RSX-11M/M-PLUS systems, you cannot extend a task that uses memory-resident overlays. (See the RSX-11M/M-PLUS Task Builder Manual.)

Default: The size specified at task-build time.

/IOP=option

Specifies that a privileged task can overmap the I/O page. The options are YES and NO. If you specify /IOP=YES, RUN assumes that the task will overmap the I/O page (APR7) and, if the task is larger than 8K words, issues a warning message. If you specify /IOP=NO, RUN assumes that the task does not need to use the I/O page. No warning message is issued.

/IOP complements the Task Builder /IP switch. Specifying /IP informs RUN that the task is intentionally overmapping the I/O page.

Default: /IOP=YES.

/PAR=parname

Specifies the partition in which the task is to be installed.

Default: Partition specified at task-build time.

/PMD=option

Requests a Postmortem Dump when the task aborts. The options are YES and NO. If you specify /PMD=YES, a Postmortem Dump is requested for the task if it aborts because of an SST error condition. If you specify /PMD=NO, no dump is requested at SST abort time.

To generate a dump, the Postmortem Dump task PMD... must be installed in the system. This keyword overrides the /PM switch specified at task-build time.

Default: Specified at task-build time.

RUN (Cont.)

/PRI=number

(Privileged keyword.) Specifies the priority of the task. The value range is 1 through 250(10), where 250 is the highest priority. Standard number conventions apply: octal by default, decimal if followed by a period. (This keyword is ignored if specified by a nonprivileged user.)

Default: /PRI=50.

/ROPAR=pname

(RSX-11M-PLUS systems only.) Installs the read-only portion of a multiuser task into a specified partition (pname). If the specified partition does not exist, the read-only segment is installed in the same partition as the task.

/SLV=option

Specifies the slave status of the task. The two options are YES and NO. If /SLV=YES, data sent to the installed task is marked with the TI: of the sending task. When the installed task receives the data, the system sets the task's TI: to that associated with the data. This keyword overrides the /SL switch specified at task build.

If /SLV=NO, the TI: of the task does not change when receiving data.

Default: Specified at task-build time.

/TASK=taskname

Specifies the name the task will use while it is running. This name is a temporary assignment only. If taskname is not found in the STD, MCR names it TTnn by default, where nn is the unit number of the requesting terminal.

/TIME=nM or /TIME=nS

(RSX-11M-PLUS systems with Resource Accounting only.) Sets a time limit for a task that uses the CPU. When the time limit expires, the task is aborted and a message is displayed.

You can specify the time limit in minutes (M) or seconds (S); M is the default. The number of time units (n) can be octal (the default) or decimal if followed by a period. The maximum value allowed is 65,536(10).

If the task is privileged, the keyword is ignored.

Resource Accounting is a system generation option.

RUN (Cont.)

/UIC=[g,m]

Specifies the UIC under which the task will be requested to run. The square brackets are required syntax.

If you specify a UIC, the UIC becomes the default UIC for the task. However, your protection UIC becomes the protection UIC for the task. If you do not specify a UIC, your default and protection UICs become the default and protection UICs for the task. (See the previous description of /UIC for the effects for privileged users and tasks.)

Default: the UIC of the terminal that issues the RUN command.

Examples:

```
>RUN TR7 15M
```

Runs task TR7 15 minutes from the time the command was issued.

```
>RUN XKE 15M/RSI=90S/UIC=[3,1]
```

Runs task XKE 15 minutes from the time the command was issued, rescheduling it every 90 seconds, with a UIC of [3,1].

```
>RUN DK2:$MAC
```

Runs the task in file DK2:MAC.TSK from the system directory. The task is automatically installed, run, and removed on exit.

Notes:

- If the command requests the task to run immediately (Format 1), it establishes the terminal from which the task was initiated as the pseudo device TI:. For Formats 2, 3, and 4, the system establishes the issuing terminal as the pseudo device CO:.
- A run-immediately command (Format 1), if terminated with an ESCape character instead of a RETURN, echoes the default prompt when the requested task exits and not when MCR has finished initiating the task. This facility enables you to determine when a task that is not producing output on a terminal has exited.
- The install-run-remove format (Format 5) also establishes the terminal from which the command was issued as the pseudo device TI: and causes the default prompt to be displayed on TI: when the task exits. This form of the command is especially useful when the space available in the dynamic storage region (pool) is low because the memory necessary for a Task Control Block (TCB) returns to pool when the task exits.

RUN (Cont.)

Command Error Messages:

RUN -- INVALID TIME PARAMETER

A specified time field was incorrect.

RUN -- TASK BEING ABORTED

A request for the execution of a task was made, but the task was being aborted either because of an unrecoverable error or an abort command or directive issued by a user.

SAV

SAVE (P)

The SAVE command copies the current RSX-11M/M-PLUS system image (the contents of main memory) into the system image file from which the current image was booted. (The system image file is a special task image file named, by convention, RSX11M.SYS.) The command saves the image so that a hardware bootstrap or the BOOT command can later be used to reload and restart it.

On RSX-11M, the system image cannot be greater than 124K; on RSX-11M-PLUS, there is no size restriction. The size of the system image file determines the maximum size that can be saved on RSX-11M-PLUS, but there are other restrictions on the system image file: it must be contiguous and it must be large enough to contain all of secondary pool. (SAVE saves secondary pool because prototype Task Control Blocks - TCBs - are contained in it.)

All RSX-11M/M-PLUS system images reside on a file-structured volume as a specially formatted task image: the image does not have a task header. There may be more than one system image on a volume (for example, a program development system and a production or test system), and nonprivileged tasks can be installed in several system images at the same time.

To determine the minimum size for a system image file, compute the formula of four times the size plus two (4*SYSIZ+2). For example:

28K requires 114. blocks

32K requires 130. blocks

124K requires 498. blocks

256K requires 1026. blocks

You can save system images on any of the following devices:

RSX-11M systems		RSX-11M-PLUS systems	
RL01/02	RD51	RL01/02	RP02/03
RK05	RP02/03	RK05	RP04/05/06
RK06/07	RP04/05/06	RK06/07	RP07
RM02/03/05/80	RX01/02	RM02/03/05/80	RD51
RP07	RX50	RA60	RX50
RA60	RS03/04	RA80/81	ML11
RA80/81	DECtape	RC25	
RC25	ML11		

On RSX-11M-PLUS, system images saved on the following devices are considered to be compatible; that is, a system image saved on one of the devices can be transported with the Backup and Restore Utility (BRU) to any of the other devices. (See the RSX-11M/M-PLUS Utilities Manual for information on BRU.) The compatible devices are:

ML11	RA80/81	RC25
RK06/07	RP04/05/06	RD51
RM02/03/05/80	RP07	RX50
RA60		

SAV (Cont.)

To successfully save a system, the SAVE command requires that:

1. On an RSX-11M system, SAVE must run from CO:.
2. Error logging is not active.
3. All tasks must be installed from LB:.
4. No checkpoint files are active.
5. No volumes except the load device are mounted.
6. The load device can be successfully dismounted.
7. No tasks have outstanding I/O.
8. No tasks are connected to interrupts.
9. All drivers, active tasks, fixed tasks and, on RSX-11M-PLUS systems, all loaded commons and secondary pool reside within the amount of main memory that SAVE will write to the system image file.

On RSX-11M-PLUS systems, SAVE also requires that:

1. Resource Accounting must be turned off.
2. All checkpointable commons must be installed from LB:.
3. All device units and device controllers, except the load device, the TI: of SAVE, any other pseudo devices, and the reconfiguration driver (RD:), must be off line. A virgin system image satisfies this requirement. For all other systems, take the units and controllers off line with the reconfiguration services (see the RSX-11M/M-PLUS System Management Guide).
4. On multiprocessor systems, SAVE run on the only active processor.

An error is reported if any of these requirements are not met.

SAVE is active when the memory-resident system image is copied to disk. Because of this, VMR considers SAVE to be an active task in the system image. This is correct because SAVE is the task that starts the system after a boot.

The Executive references the file images of installed tasks by physical addresses (Logical Block Numbers, or LBNs). A saved system does not always retain the physical disk addresses of installed tasks. For example, the Disk Save and Compress Utility Program (DSC) can compress and copy a disk containing a saved system, thus moving the task files to different physical locations. Therefore, SAVE converts the LBNs of all installed tasks into file identifications and stores these in the TCBs. Since the TCB entries contain task file identifications rather than LBNs after a system save, the system can function normally when it is rebooted even if LBNs have changed in the meantime.

SAV (Cont.)

Upon system rebooting, SAVE reopens the task file and stores the new LBN of the task in the TCB. If a task has been deleted, the system cannot open the task file when the system is rebooted. In this case, the system automatically removes the task's TCB from the STD.

On RSX-11M-PLUS systems, since installed common regions and read-only segments of multiuser tasks face a similiar problem, SAVE also converts the absolute pointers for these into relative pointers and restores the pointers when the system is booted.

When the bootstrap block is written, the physical disk-block address of the system image file is stored with it. However, the file can be deleted. If there is file system activity, the blocks previously allocated to the system image may be reallocated to another file. A subsequent bootstrap that uses the boot block could possibly cause random data to be loaded.

Upon rebooting a saved system, SAVE:

- Selects the system clock
- If the last memory partition is system-controlled, sizes memory and extends the partition so that it uses all available memory
- On multiuser protection systems, validates that the boot device is not allocated and then sets it public
- Sets the context of the console terminal as logged in, privileged, and nonslaved
- Sizes the boot device (RSX-11M-PLUS systems)
- Outputs a system identification message
- Redirects all pseudo devices to the boot device
- Mounts the system disk
- Initiates the file [1,2]STARTUP.CMD on the booted device

Format:

```
SAV[E] [/keyword(s)]
```

Keywords:

/WB

Indicates that a hardware boot block pointing to the system image is to be written to the system device. The new boot block points to the file that is saved with the SAVE command. Thus, on the next hardware bootstrap, this saved file will be loaded. If the command line omits the /WB keyword, the boot block still points to the prior system image, which may have been overwritten.

SAV (Cont.)

/MOU="string"

Automatically issues a MOUNT command at system startup to mount the system disk.

The MOUNT command line ("string") that you specify must be enclosed within quotes and must be in the proper format (that is, including all necessary slashes (/) or equal signs (=)). Note that SAVE does not check the syntax of the string.

/SFILE="filespec"

Automatically initiates an indirect command file ([1,2]STARTUP.CMD) on the boot device at system startup. This keyword allows you to specify another indirect command file.

The command file you specify must be enclosed within quotes. Note that SAVE does not check the syntax of filespec.

/CSR=x

(RSX-11M-PLUS systems only.) Permits you to specify the CSR address for the boot device. The options for x are SY and an octal number that is greater than 157777 and even.

If you do not specify /CSR, SAVE uses the address the bootstrap left in R1 as the CSR address for the boot device. If you specify /CSR=SY, SAVE uses the CSR address that was used to save the system. If x is an octal number, SAVE uses the number as the CSR address.

Note that if you are transporting the saved system image to a system that has a different CSR address, you must use VMR's CON command to adjust the data base CSR and vector addresses for the image before you can boot it. (See the RSX-11M/M-PLUS System Management Guide for information on VMR.)

You do not have to specify /CSR for compatible devices (see previous list).

Example:

>SAV

The current status of the system is saved on the system disk. System changes made by the REDIRECT command or other MCR commands are also saved with the system image that is resident in main memory.

Command Error Messages (RSX-11M-PLUS-only messages are described last):

SAV -- BAD TASK FILE VBN, TASK REMOVED - taskname

SAVE removed the specified task because it contained a bad virtual block number (VBN) in its file header. The task image file has probably been corrupted.

SAV (Cont.)

SAV -- BOOTED DEVICE'S DRIVER NOT LOADED

VMR has been used to unload the driver for the system (booted) disk. Using another system, use VMR to load the driver and then reboot the system.

SAV -- BOOTED DEVICE NOT IN SYSTEM - dd nnn mmmmmm

When the system was booted, SAVE could not find the booted device (device name dd, physical unit number nnn, CSR mmmmmm) in the system data structures. For example, the system was booted from DB3:, but the system data structures include only DB0: and DB1:.

On RSX-11M-PLUS multiprocessor systems, the boot device must be directly connected to the target processor; it cannot be connected via a bus switch.

SAV -- CANNOT FIND HOME BLOCK

SAV could not find the device's home block when searching for it or, on RSX-11M-PLUS systems, an error occurred while SAV was attempting to read the home block.

SAV -- CHECKPOINT FILE STILL IN USE ON ddnn:

The system cannot be saved because a checkpoint file on the specified device is still active. Deallocate the checkpoint file (see the ACS command) and reenter the SAVE command line.

SAV -- CO: REDIRECTED TO CO:

(RSX-11M systems only.) The console output driver is active. If it is not active, the system may be corrupted. You can use the OPEN command to redirect CO: to the terminal from which you are running SAVE.

SAV -- COMMON, DRIVER OR TASK ABOVE SYSTEM IMAGE FILE LIMIT

A system cannot be saved if addresses for a memory-resident structure are higher than the highest address of main memory written to the system image file. Use the PARTITION DEFINITIONS command (PAR) to determine the cause of the problem. This includes the running task image of SAVE.

SAV -- DISMOUNT COMPLETE FOR ddnn:

This is an informational message. The message indicates that TKTN is not installed in the running system. If the load device is mounted when SAVE starts, SAVE attempts to dismount it. Since TKTN is not installed, the dismount complete message from DMO is not displayed on the console terminal. As a substitute, SAVE writes this message to the terminal.

SAV (Cont.)

SAV -- ERROR ATTEMPTING TO DISMOUNT ddnn:

If the load device is mounted when SAVE is initiated, SAVE issues a DISMOUNT command to MCR when the save operation is complete. This message indicates that the dismount operation was not successful. The system may be usable, but it is recommended that you reboot and issue a DISMOUNT command.

SAV -- ERROR LOGGING STILL ACTIVE

A system cannot be saved while error logging is active. Disable error logging and reenter the SAVE command line.

SAV -- HOME BLOCK READ ERROR

(RSX-11M systems only.) The home block of the booted device could not be read. Try another drive. If unsuccessful, the disk has been corrupted or the area of the home block is bad. This error halts the system.

SAV -- INDEX FILE HEADER CHECKSUM ERROR

While rebooting a saved system, SAVE detected a checksum error in the file header of the index file. The error causes the system to halt. The disk has probably been corrupted.

SAV -- INDEX FILE HEADER READ ERROR

While rebooting a saved system, SAVE detected an error in the file header of the index file. The error causes the system to halt.

SAV -- LABEL BLOCK I/O ERROR

In attempting to save the system image, SAVE wrote the transfer address in the label block of the system image file. An error occurred during this write attempt. The disk could be corrupted.

SAV -- MCR IS NOT INSTALLED

When a system is booted, SAVE uses MCR to mount the system disk. Use VMR to install the MCR... task.

SAV -- MUST BE RUN FROM TERMINAL CO:

SAVE is not being run from the terminal to which the pseudo device CO: is redirected. (This is not a requirement on an RSX-11M-PLUS system.)

SAV -- NO POOL SPACE

There is not enough space in pool to contain checkpoint information when SAVE tries to force resident read/write commons to their file images.

SAV (Cont.)

SAV -- NOT A VALID SAVE DEVICE

An attempt was made to save a system on a device that is not part of the system I/O data structures (this generally implies that $SYSIZ+2 and $SYSIZ+6 are corrupted) or SAVE does not support the device.

SAV -- OPEN FILES ON ddnn:

There are open files on ddnn:. Ensure that the Queue Manager is stopped.

SAV -- PARTITION parname NOT IN SYSTEM, TASK REMOVED - taskname

(RSX-11M systems only.) If a task is installed in more than one system, the partition control block addresses in its header mapping windows may not be for the booted system. The task's label block indicates that the task maps to parname, but parname is not in the current system. The label block has probably been corrupted.

SAV -- PROCESSOR DOES NOT SUPPORT EIS

(RSX-11M systems only.) Support for the Extended Instruction Set (EIS) has been selected, but the current processor cannot support it.

SAV -- SYSTEM MAY NOT BOOT CORRECTLY

The file [system-uic]SAV.TSK was not found on the boot device. If SAVE must be checkpointed to redirect and mount the booted device, the system disk will be overwritten, causing unpredictable results.

SAV -- SYSTEM MAY NOT WORK - LARGER THAN MAIN MEMORY

This message indicates that the booted system has less main memory than the saved system image file and that a structure resident in the system image file is completely or partially absent in the booted system. If the system can run without the structure, the UNLOAD and UNFIX commands can be used to remove the nonexistent structures.

SAV -- $SYSIZ DOES NOT POINT AT SYSTEM IMAGE FILE

SAVE determines the location of the system image file on the system disk by examining the locations near the Executive label $SYSIZ. SAVE then makes several validation checks on that file. If those checks fail, SAVE does not write to the disk on the assumption that it could corrupt the disk by writing to something that is not a system image file. The system image or the system image file has been corrupted. Examine several locations after $SYSIZ and then reboot.

SAV -- TASK ACTIVE IN ANOTHER SYSTEM, TASK REMOVED - taskname

The task is installed in another system as well as in the booted system. Since the task is active and mapped to dynamic regions in the other system, it cannot be run in the booted system.

SAV (Cont.)

SAV -- TASK FILE DELETED, TASK REMOVED - taskname

While rebooting a saved system, a file identification that appears in the Task Control Block (TCB) could not be found in the index file on the boot device. This indicates that the file has been deleted.

SAV -- TASK FILE HEADER ERROR, TASK REMOVED - taskname

When SAVE read the task header to restore the LBN of the task file, the checksum was bad or there was a file number mismatch. Therefore, the task was removed.

SAV -- TASK FILE HEADER READ ERROR, TASK REMOVED - taskname

SAVE removed the specified task because it could not read the task's file header.

SAV -- TASK FILE HEADER WRITE ERROR, TASK REMOVED - taskname

When SAVE attempted to reassign the LUNs of the task or to rewrite a mapping window PCB address, it could not successfully rewrite the task header. Therefore, the task was removed.

SAV -- TASK HEADER READ ERROR

SAVE detected an I/O error while reading in a task header to write the file identification into the TCB. This error causes the system to halt.

SAV -- TASK HEADER READ ERROR, TASK REMOVED - taskname

SAVE detected an I/O error while reading in a task header to reassign LUNs or to remap the mapping windows. Therefore, the task was removed.

SAV -- TASK LABEL BLOCK READ ERROR, TASK REMOVED - taskname

When SAVE attempted to reassign the LUNs of the task to the current system, the task's label block could not be read (the label block contains the static LUN assignments). Therefore, the task was removed.

SAV -- TASK TOO BIG FOR PARTITION, TASK REMOVED - taskname

The current CPU has less memory than the system image file. This message indicates that the last partition has contracted such that the indicated task cannot fit into it, even if everything else is removed from the partition.

SAV -- TASK taskname HAS OUTSTANDING I/O

A system cannot be saved if a task is waiting for I/O to complete.

SAV (Cont.)

SAV -- TASK taskname IS ACTIVE AND CHECKPOINTED

You cannot save a system if it contains an active and checkpointed task. This restriction prevents a possible system crash because, if the task was installed in another system image file, the task image could be corrupted when the task was run in the second system.

SAV -- TASK taskname IS CONNECTED TO AN INTERRUPT VECTOR

Disconnect the task from the interrupt vector or abort it, and reenter the SAVE command line.

SAV -- TASK taskname NOT INSTALLED FROM AN LB:

All tasks must be installed from an LB:. Use the TAS command to determine which tasks are not. Reenter the SAVE command line after removing the tasks or installing them from an LB:.

SAV -- VOLUME STILL MOUNTED ON ddnn:

The volume on device ddnn: was still mounted when the SAVE command line was issued. A system cannot be saved with volumes mounted. Dismount the volumes and reenter the SAVE command line. If necessary, use the DEVICES command to determine which volumes are mounted.

SAV -- VOLUME STRUCTURE NOT SUPPORTED

While rebooting a saved system, SAVE determined from the disk's home block that the disk's structure is not supported by the current version of RSX-11M/M-PLUS. This error causes the system to halt.

SAV -- (WARNING) NONEXISTENT LUN ASSIGNMENT FOR TASK taskname

The physical device to which SAVE was attempting to reassign a LUN does not exist in the booted system. This condition is resolved if the task performs a run-time assignment to the LUN; otherwise, the task will encounter an error condition when it attempts to use the LUN.

Additional RSX-11M-PLUS Command Error Messages:

SAV -- ACCOUNTING IS ACTIVE

SAVE cannot save a system if Resource Accounting is still active.

SAV -- BOOTED DEVICE CANNOT BE BROUGHT ONLINE

There was an error when SAVE attempted to bring either the unit or controller of the booted device on line. The Executive is corrupted, the device driver does not work, or the device does not work. There is no recovery procedure.

SAV (Cont.)

SAV -- COMMON commonname NOT INSTALLED FROM AN LB:

All checkpointable commons must be installed from an LB:. Remove the common and reenter the SAVE command line.

SAV -- COULD NOT SIZE BOOTED DEVICE

SAVE recognized the device name as a device that it should be able to size, but could not.

SAV -- PROPER CONTROLLERS AND/OR UNITS ARE NOT OFFLINE

When a system is saved, all device units and device controllers except the TI: for SAVE and the load device must be off line. Use the CON DISPLAY command to determine which devices are on line and then issue a CON OFFLINE ALL command.

SAV -- SECONDARY POOL DOES NOT FIT INTO SYSTEM IMAGE

The system image file is not large enough to contain all of secondary pool. You must either use the VMR SET /PAR command to place secondary pool in a lower portion of memory, or use the PIP utility to make the system image file larger and then run VMR to reinitialize the file.

SAV -- SYSTEM MAY NOT WORK - CORRUPTED FILE FOR COMMON comname

When SAVE attempted to convert the file-ID for the common, SAVE found that the task image of the checkpointable common was corrupted or had been deleted. SAVE altered the system data structures to prevent checkpointing of the common into what may now be another task image.

SET

SET (NP,P)

The SET command dynamically changes characteristics of and displays information about the system, tasks, and devices.

Nonprivileged users can change the characteristics of their own terminals (pseudo device TI:) and any privately allocated device. Privileged users can change the characteristics of any device and also of any task and of the system. All users can display information about any device or task or about the system.

The following two lists describe all the available options for nonprivileged and privileged users.

Nonprivileged options:

- Establish characteristics for the issuing terminal (TI:) and for private devices
- Set the default UIC for the issuing terminal
- Display the status (determined by the keyword specified) of all terminals and other devices
- Display statistics about system dynamic memory

Privileged options:

- Establish characteristics for any device in the system
- Establish the default UIC for any terminal in the system
- Establish the default UIC for DECnet-related tasks
- Establish the system UIC.

  On RSX-11M-PLUS systems, also establish the library UIC used by the LOAD command and the install-run-remove option of the RUN command
- Set a device to public status so that any system user can access the device
- Create partitions and subpartitions
- Move the top boundary of a partition
- Add space to the dynamic core pool
- Modify the pool limit parameters used by the Pool Monitor Task
- Enable write check on devices that support it

SET (Cont.)

- Specify I/O queue optimization for a device (RSX-11M-PLUS only)
- Specify the maximum number of I/O packets to be preallocated to optimize I/O performance
- Specify the maximum size to which a task can extend itself.
- Enable or disable the ability to log in on terminals in a multiuser protection system

Improper use of the SET command from a privileged terminal can result in a situation in which privileged user input will not be accepted. Avoid the following two situations:

- All privileged terminals in the system are slaved and cannot enter unsolicited input to MCR, and logins are disabled. Nonprivileged terminals cannot enter privileged commands and therefore cannot reset the privileged terminals to be nonslaved. See the description of the /SLAVE keyword in the "Keywords" section in the following pages.
- The buffer length of all the nonslaved, privileged terminals is shorter than 14 bytes on RSX-11M and shorter than 2 bytes on RSX-11M-PLUS. The terminal buffer is then too small for a privileged user to enter many important commands required to continue system operation or to alter the status of other terminals. See the description of the /BUF keyword in the "Keywords" section in the following pages.

On RSX-11M, a number of SET command keywords (/CRT, /ESCSEQ, /HOLD, /LOGON, /LOWER, /MAXEXT, /MAXPXT, /PLCTL, /PUB, and /WCHK) are features that you must include at system generation. If you did not include support at system generation, the specified keyword has no effect.

Also, some keywords (/ABAUD, /EBC, /FDX, /HFILL, /HHT, /LINES, /RPA, /TERM, /TYPEAHEAD, /VFILL, and /WRAP) are only supported with the full-duplex terminal driver. The full-duplex terminal driver is a system generation option in RSX-11M systems but is always included in RSX-11M-PLUS systems. Note that if you select the full-duplex driver on RSX-11M, you must also select the get/set multiple characteristics option to display or set any terminal-related characteristics.

Format:

```
SET /keyword=values
```

Only one keyword per command line is permitted. You can prefix most keywords with NO to negate or disable the function of the keyword. (Exceptions are noted in Table 3-3. The system returns a syntax error message whenever NO precedes one of these keywords.) The keywords are described in alphabetical order following Table 3-3.

SET (Cont.)

Table 3-3
SET Keywords

Type	Keywords
Device Characteristics	/[NO]ABAUD[=TTnn:]
	/[NO]BRO[=TTnn:]
	/BUF=ddnn:[size]
	/CLI=TTnn:[cli]
	/[NO]CRT[=TTnn:]
	/DCL[=TTnn:]
	/[NO]EBC[=TTnn:]
	/[NO]ECHO[=TTnn:]
	/[NO]ESCSEQ[=TTnn:]
	/[NO]FDX[=TTnn:]
	/[NO]FORMFEED[=TTnn:]
	/HFILL=TTnn:[value]
	/[NO]HHT[=TTnn:]
	/[NO]HOLD[=TTnn:]
	/LINES=TTnn:[value]
	/[NO]LOWER[=ddnn:]
	/MCR[=TTnn:]
	/[NO]OPT=[ddnn:opttyp:fairness-count] (RSX-11M-PLUS systems only)
	/[NO]OVLP[=ccn] (RSX-11M-PLUS systems only)
	/[NO]PRIV[=TTnn:]
	/[NO]PUB[=ddnn:]
	/[NO]REMOTE[=TTnn:[speed]]

(continued on next page)

SET (Cont.)

Table 3-3 (Cont.)
SET Keywords

Type	Keywords
	/[NO]RPA[=TTnn:] /[NO]SERIAL[=TTnn:] (RSX-11M-PLUS systems only) /[NO]SLAVE[=TTnn:] /SPEED=TTnn:[recv:xmit] /TERM=TTnn:[value] /[NO]TYPEAHEAD[=TTnn:[size]] /UIC[=[uic][:TTnn:]] /[NO]VFILL[=TTnn:] /[NO]WCHK[=ddnn:] /[NO]WRAP[=TTnn:]
Enable/Disable Login (privileged options)	/[NO]LOGON
I/O Packet	/MAXPKT[=n]
Library or System UICs	/LIBUIC[=[uic]] (RSX-11M-PLUS systems only) /NETUIC[=[uic]] /SYSUIC[=[uic]]
Memory Allocation (see notes before error messages)	/MAIN=pname[:base:size:type] (RSX-11M systems; synonym for /PAR on RSX-11M-PLUS systems;) /NOMAIN=pname /MAXEXT[=size] /NOCEX (RSX-11M-PLUS systems only) /PAR=pname[:base:size[:type]] (RSX-11M-PLUS systems only)

(continued on next page)

SET (Cont.)

Table 3-3 (Cont.)
SET Keywords

Type	Keywords
	/NOPAR=pname (RSX-11M-PLUS systems only) /POOL[=top] /SECPOL (RSX-11M-PLUS systems only) /SUB=mname:sname[:base:size] (RSX-11M systems only) /NOSUB=mname:sname (RSX-11M systems only) /TOP
Pool Monitor Task	/PLCTL[=[high][:[low][:[frz][:[basep]]]]
Console Output Task	/COLOG
System Tuning	/RNDC[=nn] /RNDH[=nn] /RNDL[=nn] /SWPC[=nn] /SWPR[=nn]

Keywords:

/ABAUD[=TTnn:]

(Full-duplex terminal driver only.) Enables autobaud detection for the remote dial-up line for the specified terminal. The terminal driver samples the line's first input character, tries to determine the incoming baud rate, and sets the interface speed accordingly.

A nonprivileged user can display all the terminals that have autobaud detection enabled, but only a privileged user can enable the option for a specific terminal.

When you omit =TTnn:, the system displays all the terminals with autobaud detection.

SET (Cont.)

Examples:

```
>SET /ABAUD=TT10:
```

Enables autobaud detection for TT10:.

```
>SET /ABAUD
ABAUD=TT4:
ABAUD=TT5:
ABAUD=TT6:
ABAUD=TT10:
```

Displays all the terminals that have autobaud detection enabled.

/NOABAUD[=TTnn:]

(Full-duplex terminal driver only.) Disables autobaud detection for the specified terminal. The terminal driver does not attempt to determine the incoming baud rate for the remote dial-up line.

A nonprivileged user can display all the terminals that have had autobaud detection disabled, but only a privileged user can disable the option for a specific terminal.

When you omit =TTnn:, the system displays all the terminals that do not have autobaud detection.

Examples:

```
>SET /NOABAUD=TT6:
```

Disables autobaud detection for TT6:.

```
>SET /NOABAUD
NOABAUD=CO0:
NOABAUD=TT4:
NOABAUD=TT6:
NOABAUD=TT7:
```

Displays all the terminals that do not have autobaud detection enabled.

/BRO[=TTnn:]

Enables the broadcast option for the specified terminal. The terminal can receive messages sent from other terminals with the BROADCAST command.

When you omit =TTnn:, the system displays all the terminals that can receive messages.

/BRO is valid only on systems that have multi-CLI support.

SET (Cont.)

Examples:

```
>SET /BRO=TT7:
```

Enables the broadcast option for TT7:.

```
>SET /BRO
BRO=CO0:
BRO=TT4:
BRO=TT5:
BRO=TT6:
BRO=TT7:
```

Displays all the terminals that have the broadcast option enabled.

/NOBRO[=TTnn:]

Disables the broadcast option for the specified terminal. The terminal cannot receive messages sent from other terminals. The terminal also cannot receive messages from the SHUTUP program until the last five minutes before system shutdown. It is recommended that you not use the /NOBRO keyword unless you need to because you could miss important messages.

When you omit =TTnn:, the system displays all the terminals that cannot receive messages.

/NOBRO is valid only on systems that have multi-CLI support.

Examples:

```
>SET /NOBRO=TT4:
```

Disables the broadcast option for TT4:.

```
>SET /NOBRO
NOBRO=TT4:
NOBRO=TT10:
```

Displays all the terminals that have the broadcast option disabled.

/BUF=ddnn:[size]

Sets or displays the default buffer size of the specified device. A nonprivileged user can display the buffer size of any device but can only set the buffer size of TI:. A privileged user can set the buffer size for any device.

The specified size must be greater than 0 and less than or equal to 255(10). If ddnn: is a terminal, the specified size must be greater than 15(10) and less than or equal to 255(10). /BUF is particularly useful for defining line printer width (80 or 132 decimal columns) and the maximum number of characters allowed in a command line.

When you omit size, the system displays the buffer size of the specified device.

Example:

```
>SET /BUF=LP0:
BUF=LP0:132.
```

Displays the current buffer size of LP0:.

```
>SET /BUF=TT1:40.
```

Sets TT1: buffer size to 40(10).

/CLI=TTnn:[cli]

Defines the default command line interpreter (CLI) for the specified terminal. The CLI can be MCR, DCL, or a user-written CLI. (However, note that before a CLI can be used, it must be installed with the INSTALL /CLI=YES command.)

A nonprivileged user can display the default CLI for any terminal but can only set the CLI for TI:. A privileged user can set the default CLI for any terminal.

When you omit cli, the system displays the current default CLI for the specified terminal.

/CLI is valid only on systems that have multi-CLI support.

Examples:

```
>SET /CLI=TI:
CLI=TI:MCR
```

Displays the current default CLI for TI:.

```
>SET /CLI=TI:ACLI
```

Sets the default CLI for TI: to ACLI.

/COLOG

This keyword is documented with the Console Output Task (COT) in the RSX-11M/M-PLUS System Management Guide.

/CRT[=TTnn:]

Defines the specified terminal as a Cathode Ray Tube (CRT) and enables the backwards deletion option. Typing the RUBOUT or DELETE key moves the printing position one space to the left and erases any character displayed in that position.

A nonprivileged user can display all terminals defined as CRTs but can only define TI: as a CRT. A privileged user can define any terminal as a CRT.

SET (Cont.)

When you omit =TTnn:, the system displays all the terminals that are defined as CRTs.

Examples:

```
>SET /CRT=TT3:
```

Enables the backwards deletion option for terminal TT3:.

```
>SET /CRT
CRT=TT3:
CRT=TT4:
```

Displays all the terminals that have the backwards deletion option enabled.

/NOCRT[=TTnn:]

Deletes the CRT status of the specified terminal and disables the backwards deletion option.

A nonprivileged user can display all the terminals not defined as CRTs but can only delete CRT status for TI:. A privileged user can delete CRT status for any terminal.

When you omit =TTn:, the system displays all the terminals that are not defined as CRTs.

Examples:

```
>SET /NOCRT=TT4:
```

Disables the backwards deletion option for TT4:

```
>SET /NOCRT
NOCRT=TT0:
NOCRT=TT1:
NOCRT=TT2:
NOCRT=TT4:
```

Displays all the terminals that have the backwards deletion option disabled.

/DCL[=TTnn:]

Enables the recognition of DIGITAL Command Language (DCL) commands at the specified terminal. Commands entered in response to the default prompt are submitted to DCL.

To return a terminal to MCR command recognition, type the DCL command SET TERMINAL MCR.

A nonprivileged user can display all the terminals that recognize DCL commands but can only enable DCL recognition for TI:. A privileged user can enable DCL command recognition for any terminal.

SET (Cont.)

When you omit =TTnn:, the system displays all the terminals that have DCL command recognition enabled.

/DCL is valid only on systems that have multi-CLI support.

Examples:

```
>SET /DCL=TT3:
```

Enables DCL command recognition for TT3:.

```
>SET /DCL
DCL=TT3:
DCL=TT7:
DCL=TT10:
DCL=TT12:
```

Displays all the terminals that recognize DCL commands.

/EBC[=TTnn:]

(Full-duplex terminal driver only.) Enables the 8-bit character option. The terminal driver passes all eight bits of the input characters to the specified terminal.

A nonprivileged user can display all terminals that have the option enabled but can only enable the EBC option for TI:. A privileged user can enable the EBC option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the EBC option enabled.

Examples:

```
>SET /EBC=TT3:
```

Enables the EBC option for terminal TT3:.

```
>SET /EBC
EBC=TT3:
EBC=TT5:
```

Displays all the terminals that have the EBC option enabled.

/NOEBC[=TTnn:]

(Full-duplex terminal driver only.) Disables the 8-bit character option. Before passing the input characters to the device, the terminal driver removes the parity bits.

A nonprivileged user can display all terminals that have the option disabled but can only disable the EBC option for TI:. A privileged user can disable EBC for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the EBC option disabled.

SET (Cont.)

Examples:

```
>SET /NOEBC
NOEBC=TT0:
NOEBC=TT1:
NOEBC=TT2:
NOEBC=TT4:
```

Displays all terminals that have the EBC option disabled.

```
>SET /NOEBC=TT3:
```

Disables the EBC option for terminal TT3:.

/ECHO[=TTnn:]

Instructs the terminal driver to display each character typed on the specified terminal.

A nonprivileged user can display all terminals that echo typed characters but can only enable the echo option for TI:. A privileged user can enable the echo option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the echo option enabled.

Examples:

```
>SET /ECHO=TT3:
```

Enables the echo option for terminal TT3:.

```
>SET /ECHO
ECHO=TT1:
ECHO=TT3:
```

Displays all the terminals that have the echo option enabled.

/NOECHO[=TTnn:]

Instructs the terminal driver to inhibit the display of all input characters typed on the specified terminal.

Note that on RSX-11M systems with the half-duplex terminal driver, unsolicited input is always echoed. Only input solicited by a task is not echoed when you specify /NOECHO.

A nonprivileged user can display all terminals that do not echo typed characters but can only disable the echo option for TI:. A privileged user can disable the echo option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the echo option disabled.

SET (Cont.)

Examples:

```
>SET /NOECHO
NOECHO=TT0:
NOECHO=TT2:
NOECHO=TT4:
```

Displays all the terminals that do not echo typed characters.

```
>SET /NOECHO=TT3:
```

Disables the echo option for terminal TT3:.

/ESCSEQ[=TTnn:]

Enables the recognition of escape sequences from the specified terminal. The terminal driver treats the ESC character as the beginning of an escape sequence rather than as a line terminator. See the RSX-11M/M-PLUS I/O Drivers Reference Manual for further information about escape sequences.

A nonprivileged user can display all terminals that can send and receive escape sequences but can only enable escape sequence recognition for TI:. A privileged user can enable escape sequence recognition for any terminal.

When you omit =TTnn:, the system displays all the terminals that can send and receive escape sequences.

Examples:

```
>SET /ESCSEQ=TT3:
```

Establishes TT3: as a terminal that can send and receive escape sequences.

```
>SET /ESCSEQ
ESCSEQ=TT3:
ESCSEQ=TT5:
ESCSEQ=TT10:
```

Displays all the terminals that can send and receive escape sequences.

/NOESCSEQ[=TTnn:]

Disables the recognition of escape sequences at the specified terminal.

A nonprivileged user can display all terminals that do not recognize escape sequences but can only disable the option for device TI:. A privileged user can disable escape sequence recognition for any terminal.

When you omit =TTnn:, the system displays all the terminals with escape sequence recognition disabled.

SET (Cont.)

Examples:

```
>SET /NOESCSEQ=TT3:
```

Disables escape sequence recognition for TT3:.

```
>SET /NOESCSEQ
NOESCSEQ=TT0:
NOESCSEQ=TT1:
NOESCSEQ=TT2:
NOESCSEQ=TT3:
NOESCSEQ=TT4:
```

Displays all the terminals that cannot send or receive escape sequences.

/FDX[=TTnn:]

(Full-duplex terminal driver only.) Instructs the terminal driver to accept input from the specified terminal while simultaneously outputting to it.

A nonprivileged user can display all the full-duplex terminals but can only enable the option for TI:. A privileged user can enable the full-duplex option for any terminal.

When you omit =TTnn:, the system displays all the full-duplex terminals.

Examples:

```
>SET /FDX=TT3:
```

Declares that TT3: is a full-duplex terminal.

```
>SET /FDX
FDX=TT1:
FDX=TT3:
```

Displays all the full-duplex terminals.

/NOFDX[=TTnn:]

(Full-duplex terminal driver only.) Disables the full-duplex option; the terminal driver does not simultaneously process input and output from the specified terminal.

A nonprivileged user can display all terminals that have the full-duplex option disabled but can only disable the option for TI:. A privileged user can disable the full-duplex option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the full-duplex option disabled.

SET (Cont.)

Examples:

```
>SET /NOFDX=TT3:
```

Disables the full-duplex option for terminal TT3:.

```
>SET /NOFDX
NOFDX=TT0:
NOFDX=TT2:
NOFDX=TT3:
NOFDX=TT4:
```

Displays all the terminals that do not process input and output simultaneously.

/FORMFEED[=TTnn:]

Indicates that the specified terminal has a hardware form feed.

A nonprivileged user can display all terminals that have a hardware form feed but can only declare it for TI:. A privileged user can declare it for any terminal.

When you omit =TTnn:, the system displays all the terminals that have a hardware form feed.

Examples:

```
>SET /FORMFEED
FORMFEED=TT1:
```

Displays all the terminals that have a hardware form feed.

```
>SET /FORMFEED=TT3:
```

Declares that TT3: has a hardware form feed.

/NOFORMFEED[=TTnn:]

Indicates that the specified terminal will not have a hardware form feed.

A nonprivileged user can display all terminals that do not have a hardware form feed but can only specify the option for TI:. A privileged user can specify the option for any terminal.

When you omit =TTnn:, the system displays all the terminals that do not have a hardware form feed.

Examples:

```
>SET /NOFORMFEED
NOFORMFEED=TT0:
NOFORMFEED=TT2:
NOFORMFEED=TT4:
```

Displays all the terminals that do not have a hardware form feed.

SET (Cont.)

```
>SET /NOFORMFEED=TT3:
```

Specifies that TT3: will not have a hardware form feed.

/HFILL=TTnn:[value]

(Full-duplex terminal driver only.) Specifies the number of fill characters (value) that the terminal driver places after a carriage return when outputting to a terminal. The range for value is 0 through 7.

A nonprivileged user can display the number of fill characters for any terminal but can only change the value for TI:. A privileged user can specify the number of fill characters for any terminal.

When you omit value, the system displays the fill character value for the specified terminal.

Examples:

```
>SET /HFILL=TT3:
HFILL=TT3:0
```

Displays the number of fill characters for TT3:.

```
>SET /HFILL=TT3:3
```

Specifies for TT3: that three fill characters follow a carriage return.

/HHT[=TTnn:]

(Full-duplex terminal driver only.) Indicates to the terminal driver that the specified terminal has a hardware horizontal tab.

A nonprivileged user can display all terminals that have a hardware horizontal tab but can only declare it for TI:. A privileged user can declare it for any terminal.

When you omit =TTnn:, the system displays all the terminals that have a hardware horizontal tab.

Examples:

```
>SET /HHT
HHT=TT4:
HHT=TT6:
HHT=TT7:
```

Displays all the terminals that have a hardware horizontal tab.

```
>SET /HHT=TT3:
```

Declares that TT3: has hardware horizontal tabs.

SET (Cont.)

/NOHHT[=TTnn:]

(Full-duplex terminal driver only.) Indicates that the specified terminal does not have a hardware horizontal tab.

A nonprivileged user can display all terminals that do not have a hardware horizontal tab but can only declare it for TI:. A privileged user can declare it for any terminal.

When you omit =TTnn:, the system displays all the terminals that do not have a hardware horizontal tab.

Examples:

```
>SET /NOHHT
NOHHT=TT0:
NOHHT=TT1:
NOHHT=TT2:
```

Displays all the terminals that do not have a hardware horizontal tab.

```
>SET /NOHHT=TT3:
```

Declares that TT3: does not have a hardware horizontal tab.

/HOLD[=TTnn:]

Enables hold-screen mode at the specified CRT terminal. When hold-screen mode is enabled, the terminal displays output one screenful at a time. The screenful of output remains on the screen until you type the SCROLL key while pressing the SHIFT key. The terminal then refills the screen. You can also advance the screen contents one line at a time by typing the SCROLL key.

Hold-screen mode is useful when copying files to terminals that normally transmit output at high baud rates (9600, for example). Note, however, that hold-screen mode may not be appropriate for use with certain types of programs (editors or terminals using different speeds for input and output, for example).

A nonprivileged user can display all terminals currently in hold-screen mode but can only place TI: in hold-screen mode. A privileged user can place any terminal in hold-screen mode.

When you omit =TTnn:, the system displays all the terminals currently in hold-screen mode.

Examples:

```
>SET /HOLD=TT3:
```

Enables hold-screen mode for CRT terminal TT3:. The terminal erases its screen and positions the cursor at the top left (home) of the screen.

SET (Cont.)

```
>SET /HOLD
HOLD=TT3:
HOLD=TT7:
HOLD=TT12:
```

Displays all the terminals that have hold-screen mode enabled.

/NOHOLD[=TTnn:]

Disables hold-screen mode at the specified CRT terminal.

A nonprivileged user can display all terminals not in hold-screen mode but can only disable the option for TI:. A privileged user can disable hold-screen mode for any terminal.

When you omit =TTnn:, the system displays all the terminals that have hold-screen mode disabled.

Examples:

```
>SET /NOHOLD=TT3:
```

Disables hold-screen mode for terminal TT3:.

```
>SET /NOHOLD
NOHOLD=TT0:
NOHOLD=TT3:
```

Displays all the terminals that have hold-screen mode disabled.

/LIBUIC[=[uic]]

(RSX-11M-PLUS systems only.) Establishes the UIC for the nonprivileged system task library files. This UIC usually contains nonprivileged tasks as well as utility tasks. When you issue an INSTALL or RUN command and precede the task name with a dollar sign ($taskname), the system first searches for the task under SYSUIC. If the file cannot be found, the system searches LIBUIC. The default LIBUIC is [3,54].

A nonprivileged user can only display the LIBUIC.

When you omit [=uic], the system displays the current LIBUIC.

Examples:

```
>SET /LIBUIC
LIBUIC=[3,54]
```

Displays the current library UIC.

```
>SET /LIBUIC=[6,54]
```

Sets the library UIC to [6,54].

SET (Cont.)

/LINES=TTnn:[value]

(Full-duplex terminal driver only.) Establishes the number of lines per page (value) for the terminal. The range for value is 1 through 255(10). To specify a decimal value, place a period (.) after the number.

A nonprivileged user can display the number of lines per page for any terminal but can only specify the number for TI:. A privileged user can specify the number of lines per page for any terminal.

When you omit value, the system displays the number of lines per page for the specified terminal.

Examples:

```
>SET /LINES=TT3:
LINES=TT3:24.
```

Displays the number of lines per page for TT3:.

```
>SET /LINES=TT3:20
```

Specifies in octal the number of lines per page for TT3:.

/LOGON

(Privileged keyword.) Enables logging in on terminals in a multiuser protection system.

/NOLOGON

(Privileged keyword.) Disables logging in on terminals in a multiuser protection system.

/LOGON and /NOLOGON clear and set a flag checked by the HELLO command when a user attempts to log in on a terminal. /NOLOGON provides a means of preventing users from accessing the system during such activities as system maintenance or account file maintenance.

/LOWER[=ddnn:]

Specifies that lowercase characters on a terminal or line printer are not to be converted to uppercase when they are received from the device driver. Note that this keyword only affects input from a terminal, not output to a terminal.

A nonprivileged user can display all devices that do not convert lowercase characters to uppercase but can only specify the option for TI:. A privileged user can specify the option for any terminal or line printer.

When you omit =ddnn:, the system displays all the devices for which lowercase characters are not converted to uppercase.

SET (Cont.)

Examples:

```
>SET /LOWER=TT3:
```

Inhibits conversion of lowercase characters to uppercase when they are received from TT3:.

```
>SET /LOWER
LOWER=LP0:
LOWER=TT1:
LOWER=TT3:
LOWER=TT7:
```

Displays all the devices for which lowercase characters are not converted to uppercase.

/NOLOWER[=ddnn:]

Resets the characteristics for the terminal or line printer. For terminals, lowercase characters received on input are automatically converted to uppercase and echoed as uppercase. The keyword has no effect on characters output to the terminal. For line printers, lowercase characters output to the device are printed as uppercase.

A nonprivileged user can display all the devices that perform this conversion but can only specify the option for TI:. A privileged user can specify the option for any terminal or line printer.

When you omit =ddnn:, the system displays all the devices for which conversion to uppercase is specified.

Examples:

```
>SET /NOLOWER
NOLOWER=LP1:
NOLOWER=TT0:
NOLOWER=TT2:
NOLOWER=TT4:
```

Displays all the devices that automatically convert lowercase characters to uppercase.

```
>SET /NOLOWER=TT3:
```

Resets TT3: so that lowercase characters are automatically converted to uppercase.

/MAIN=pname[:base:size:type]

(On RSX-11M-PLUS systems, synonym for /PAR.) Establishes the specified partition as a main partition. A nonprivileged user can only display the base, size, and type of a main partition.

pname

The 1- to 6-character alphanumeric partition name.

SET (Cont.)

:base

The physical base address of the partition, specified as a number of 64-byte blocks.

:size

The size of the partition, specified as a number of 64-byte blocks.

:type

The partition type:

TASK	A user-controlled task partition (RSX-11M systems only)
SYS	A system-controlled task partition
COM	A common partition
DEV	A common partition mapping into the device registers

User-controlled and system-controlled task partitions contain user tasks. Common partitions are used for resident libraries and common blocks. Device partitions are used by nonprivileged tasks to access device registers in the external page, such as those for the UDC and ICS/ICR-11.

Base and size can be entered in any of the following formats (nnnn is a number in bytes to which the system applies a multiplication factor to determine the value used):

Format	Calculated Value
nnnn	Octal (nnnn*100)
nnnn.	Decimal (nnnn.*64.)
nnnK	Octal K (nnn*4000)
nnn.K	Decimal K (nnn.*2048.)

Valid ranges of calculated values (in words) are:

Octal	0<=base<177777	0<size<2000
Decimal	0.<=base<65535	0.<size<1024.
Octal K	0K<=base<3777K	0K<size<40K
Decimal K	0.K<=base<2047.K	0.K<size<32.K

For system-controlled partitions, size may range from 0 to 1920.K or any valid representation of these limits.

For example, any of the following inputs for size will allocate a 2048(10)-byte partition.

```
40
32.
1K
1.K
```

SET (Cont.)

If you omit base, size, and type, the system displays the values of these parameters for the named partition. If the named partition is a task partition, the system also displays the parameters of all its subpartitions.

Examples:

```
>SET /MAIN=SYSPAR:420:140:TASK
```

Defines a main partition named SYSPAR as a user-controlled partition whose base address is 42000(8) and whose length is 14000(8) bytes.

```
>SET /MAIN=SYSPAR
MAIN=SYSPAR:0420:0140:TASK
```

Displays the parameters of the main partition SYSPAR. Note that if the main partition is a task partition and contains subpartitions, the parameters of the subpartition are also displayed.

/NOMAIN=pname

(On RSX-11M-PLUS systems, synonym for /NOPAR; privileged keyword.) Eliminates the specified partition from the system.

Example:

```
>SET /NOMAIN=SYSPAR
```

Eliminates the main partition SYSPAR from the system.

/MAXEXT[=size]

(Privileged keyword.) Establishes the maximum size to which a task can extend itself beyond its mapped array area by means of the EXTEND TASK directive (see the RSX-11M/M-PLUS Task Builder Manual for information about arrays and the RSX-11M/M-PLUS Executive Reference Manual for a description of the directive).

The keyword is only valid on mapped RSX-11M systems that selected the EXTEND TASK directive option during system generation and on all RSX-11M-PLUS systems. Note that a nonprivileged user can display the maximum size to which a task can extend itself (but not change the size).

The maximum size can be expressed in four formats:

```
n
nK
n.
n.K
```

See the description of the /MAIN or /PAR keyword for a definition of these size values.

When you omit =size, the system displays the current maximum size in the format:

```
MAXEXT=m
```

where m is an octal number equal to the maximum size in 64-byte blocks allowed for a task (for example, 1200 indicates 20K words).

Examples:

```
>SET /MAXEXT=20.K
```

Establishes 20.K as the maximum size to which a task can extend itself.

```
>SET /MAXEXT
MAXEXT=12000
```

Displays the current maximum size to which a task can extend itself.

/MAXPKT[=n]

Specifies the maximum number of I/O packets to be retained in a separate queue for use by the QIO directive. The number of retained packets (n) is used to optimize the servicing of QIO requests. The range for n is 0 through 15(10).

A nonprivileged user can only display the maximum and current number of available I/O packets.

When you omit =n, the system displays the maximum number and the current number of available I/O packets in the format:

```
MAXPKT=m.:c.
```

where m. is the maximum number of and c. is the current number of available I/O packets.

Examples:

```
>SET /MAXPKT=12.
```

Sets the maximum number of I/O packets retained for optimization of I/O servicing to 12(10).

```
>SET /MAXPKT
MAXPKT=12.:3.
```

Displays the maximum and current number of I/O packets. The maximum number of I/O packets to be retained explicitly for QIO processing is 12(10). Three packets are currently available.

SET (Cont.)

/MCR[=TTnn:]

Enables MCR command recognition at the specified terminal. Commands entered in response to the default prompt are submitted to MCR.

A nonprivileged user can display all the terminals that recognize MCR commands but can only specify the option for TI:. A privileged user can enable MCR command recognition for any terminal.

When you omit =TTnn:, the system displays all the terminals that recognize MCR commands.

/MCR is valid only on systems that have multi-CLI support.

Examples:

```
>SET /MCR
MCR=TT1:
MCR=TT2:
MCR=TT3:
```

Displays all the terminals that recognize MCR commands.

```
>SET /MCR=TT4:
```

Enables MCR command recognition for TT4:.

/NETUIC[=[uic]]

Specifies the UIC in which all DECnet-related tasks are stored. The keyword applies only to systems that selected the external communication products option during system generation.

On RSX-11M, if you did not select support for DECnet at system generation, NETUIC defaults to SYSUIC.

A nonprivileged user can display the current network UIC, but only a privileged user can set or change it.

When you omit =[uic], the system displays the current network UIC.

Examples:

```
>SET /NETUIC
NETUIC=[20,34]
```

Displays the current network UIC.

```
>SET /NETUIC=[110,3]
```

Sets the network UIC to [110,3].

SET (Cont.)

/NOCEX

(RSX-11M-PLUS systems only.) Deallocates Executive space reserved for use by DECnet on the pregenerated RL02 and RC25 kits.

The startup command file for the RL02 and RC25 kits automatically deallocates the reserved space, so if you intend to use DECnet, you must delete the SET /NOCEX command line from the command file.

Example:

```
>SET /NOCEX
```

Deallocates space reserved in the Executive for DECnet use so that the system can use it.

SET (Cont.)

/OPT[=ddnn:=opttyp:fairness-count]

(RSX-11M-PLUS systems only.) Enables disk I/O queue optimization for the specified device. For more information on optimization and on the algorithm (opttyp) and fairness count parameters for this keyword, see the RSX-11M/M-PLUS System Management Guide.

A nonprivileged user can display all the devices that use I/O queue optimization, but only a privileged user can enable optimization for a device.

ddnn:

The device that will use I/O queue optimization. Legal devices are DB:-, DL:-, DM:-, and DR:-type devices. When you do not specify a device, the system displays all the devices that use optimization.

opttyp

The algorithm for optimization. The algorithms are:

NEAR[EST]

ELEV[ATOR]

CSCAN

The default algorithm set at system generation is NEAR with a fairness count of 10(10).

fairness-count

The fairness count for the device. The value for this is an integer from 0 through 127(10).

When you omit =ddnn:opttyp:fairness-count, the system displays all the devices that use I/O queue optimization.

Examples:

```
>SET /OPT=DM1:NEAR:15
```

Enables I/O queue optimization for DM1:, using the NEAR algorithm with a fairness count of 15(8).

```
>SET /OPT
OPT=DB0:NEAR
OPT=DB1:NEAR:10
OPT=DM0:NEAR:10
OPT=DM1:NEAR:15
```

Displays all the disk devices that have I/O queue optimization enabled.

SET (Cont.)

/NOOPT[=ddnn:]

(RSX-11M-PLUS systems only.) Disables disk I/O queue optimization for the specified device. A nonprivileged user can display all the devices that do not use optimization, but only a privileged user can disable optimization for a device.

When you omit =ddnn:, the system displays all the devices that do not use I/O queue optimization.

Examples:

```
>SET /NOOPT=DB1:
```

Disables I/O queue optimization for DB1:.

```
>SET /NOOPT
NOOPT=DB1:
```

Displays all the devices that do not have I/O queue optimization enabled.

/OVLP[=ccn]

(RSX-11M-PLUS systems only.) Enables overlap seek support for the specified device controller. Overlapped seek support is available only on DM and RH device controllers (RH controllers are for DB:- and DR:-type devices).

A nonprivileged user can only display the device controllers that have overlap seek support enabled. A privileged user can enable overlap seek for any device controller that supports it.

When you omit =ccn, the system displays all the device controllers that have overlapped seek support enabled.

Examples:

```
>SET /OVLP=DMA
```

Enables overlapped seeks for DMA.

```
>SET /OVLP
OVLP=RHB
OVLP=DMA
```

Displays all the device controllers that have overlapped seek support enabled.

/NOOVLP[=ccn]

(RSX-11M-PLUS systems only.) Disables overlap seek support for the specified device controller.

SET (Cont.)

A nonprivileged user can only display the device controllers that support overlapped seeks but have it disabled. A privileged user can disable overlap seek support for any device controller that supports it.

When you enter -ccn, the system displays all the device controllers that support overlapped seeks but have it disabled.

Examples:

```
>SET /NOOVLP
NOOVLP=RHA
NOOVLP=RHE
```

Displays all the device controllers that support overlapped seeks but have it disabled.

```
>SET /NOOVLP=RHB
```

Disables overlapped seek support for RHB.

/PAR=pname[:base:size[:type]]

(RSX-11M-PLUS systems only.) Establishes a partition or displays an existing partition's boundaries.

A nonprivileged user can only display the base, size, and type of a partition.

pname

The 1- to 6-character alphanumeric partition name.

:base

The physical base address of the partition, specified as a number of 64-byte blocks.

:size

The size of the partition, specified as a number of 64-byte blocks. The maximum size is 0 to 1920.K words for a task, common, or main partition.

:type

The partition type:

SYS	A main partition
DEV	A common partition mapping into the device registers
DIAG	A diagnostic partition

Partition type is an optional parameter; the default type is SYS.

SET (Cont.)

SYS partitions are used for user tasks and/or loadable drivers.

DEV partitions are for device commons, which are used by tasks to access the device registers or the I/O page. The first time you create a DEV partition, the system automatically creates a main partition, named IO PAR, over the entire I/O page. The DEV partition is then created as a subpartition of IO PAR. Future device partitions are created as additional subpartitions of IO PAR. Once created, IO PAR cannot be eliminated.

DIAG partitions are for diagnostic functions on multiprocessor systems. The specified partition is created without checking the top of memory.

Base and size can be entered in any of the following formats where nnnn is a number to which a multiplication factor is applied to determine the value used:

Format	Calculated Value
nnnn	Octal (nnnn*100)
nnnn.	Decimal (nnnn.*64.)
nnnK	Octal K (nnn*4000)
nnn.K	Decimal K (nnn.*2048.)

Valid ranges of calculated values (in words) are:

Octal	0<=base<177777	0<size<2000
Decimal	0.<=base<65535	0.<size<1024.
Octal K	0K<=base<3777K	0K<size<40K
Decimal K	0.K<=base<1047.K	0.K<size<32.K

For SYS partitions, size may range from 0 to 1920.K or any valid representation of these limits. For example, any of the following inputs for size will allocate a 2048(10)-byte partition:

```
40
32.
1K
1.K
```

When you omit base, size, and type, the system displays the values of these parameters for the specified partition.

In a multiprocessor system, when you create or add device partitions, you must specify the I/O page of the desired processor. The format is

```
/AFF=[CPx]
```

where x is A, B, C, or D.

SET (Cont.)

/NOPAR=pname

(RSX-11M-PLUS systems only.) Eliminates the specified partition from the system. You cannot eliminate a partition if any tasks or commons are installed or attached to it; MCR issues an error message.

/PLCTL[=[high][:[low][:[frsiz][:basep]]]]

(Privileged keyword.) Sets the pool limit parameters used by the Pool Monitor Task (PMT). The following list defines the parameters:

high — The high pool limit in bytes.

low — The low pool limit in bytes.

frsiz — The minimum byte size of the largest free pool block required for avoiding low-pool action by the Pool Monitor Task.

basep — The base task priority, which is the lowest priority a nonprivileged task can have and still be eligible for memory contention during times of low pool; this priority remains in effect until pool conditions improve. Note that only those tasks requested while the system is in a low pool state are affected.

The following list defines the limits of the parameters:

84. <= low <= high <= total size of system pool

84. <= frsiz <= high

0. <= basep <= 250.

The following list gives the defaults for the parameters:

high 1600. bytes

low 600. bytes

frsiz 200. bytes

basep 51.

See the RSX-11M/M-PLUS System Management Guide for information on determining the values for the parameters.

When you omit the parameters, the system displays the current parameters for the system.

Example:

```
>SET /PLCTL
PLCTL=1600.:600.:200.:51.
```

Displays the current settings for the pool limit parameters.

SET (Cont.)

/POOL[=top]

Increases the size of the dynamic storage region (pool). The parameter top specifies the first location in memory to be used for user partitions. You specify the location in units of 64-byte blocks. The location can be given as an octal or decimal number.

A nonprivileged user can only display the size of the dynamic storage region.

When you omit =top, the system displays the size of the dynamic storage region in the format:

```
POOL=top:max.:total.
```

top

The first location for user partitions (displayed in bytes with two trailing zeros suppressed).

max.

The longest free block (displayed in words).

total.

The total pool space (displayed in words).

Examples:

```
>SET /POOL=1200
```

Establishes 120000(8) as the beginning location for user partitions.

```
>SET /POOL
POOL=1200:03380.:06322.
```

Displays the first location for user partitions, the longest free block, and the total of all pool space (the first free block is at 120000, the longest free block is 3380 decimal words, and the total pool space is 6322 decimal words).

/PRIV[=TTnn:]

Establishes the specified terminal as a privileged terminal.

A nonprivileged user can only display the terminals that are privileged. A privileged user can set any terminal to be privileged.

When you omit =TTnn:, the system displays all the privileged terminals.

Examples:

```
>SET /PRIV=TT1:
```

Establishes TT1: as a privileged terminal.

```
>SET /PRIV
PRIV=TT0:
PRIV=TT1:
```

Displays all the privileged terminals.

/NOPRIV[=TTnn:]

Establishes the specified terminal to be nonprivileged.

A nonprivileged user can only display the terminals that are nonprivileged. A privileged user can set any terminal to be nonprivileged.

When you omit =TTnn:, the system displays all the nonprivileged terminals.

Examples:

```
>SET /NOPRIV
NOPRIV=TT2:
NOPRIV=TT3:
```

Displays all the nonprivileged terminals.

```
>SET /NOPRIV=TT1:
```

Establishes TT1: as a nonprivileged terminal.

/PUB[=ddnn:]

(RSX-11M multiuser protection systems and RSX-11M-PLUS systems only.) Establishes the specified device as a public device. A public device is one that can be accessed by all system users. Note that allocated and already mounted devices cannot be set public. (Devices can be set public before they are mounted.)

A nonprivileged user can display all the public devices, but only a privileged user can establish a device as public.

When you omit =ddnn:, the system displays all the public devices.

Examples:

```
>SET /PUB=LP:
```

Establishes LP0: as a public device.

SET (Cont.)

```
>SET /PUB
PUB=DB0:
PUB=DB1:
PUB=LP0:
```

Displays all the public devices.

/NOPUB=[ddnn:]

(RSX-11M multiuser protection systems and RSX-11M-PLUS systems only.) Establishes the specified device as a nonpublic device. A nonprivileged user can display the devices that were previously set public but are now nonpublic, but only a privileged user can make a public device nonpublic. Note that mounted devices cannot lose their public status.

When you omit =ddnn:, the system displays all the devices actually in use that are not public devices.

Examples:

```
>SET /NOPUB
NOPUB=DK0:
NOPUB=DK1:
```

Displays all the private and unowned (nonpublic) devices.

```
>SET /NOPUB=LP0:
```

Establishes LP0: as a nonpublic device.

/REMOTE[=TTnn:[speed]]

Declares that the specified terminal is connected to a modem and can be connected by means of a dial-up network. The terminal has a line to a DH11, DHV11, DL11, DLV11, DZ11, or DZV11 multiplexer.

A nonprivileged user can display all remote lines, but only a privileged user can declare a terminal as a remote line.

Specifying speed establishes the initial baud rate (answer speed) of the remote dial-up line for the specified terminal. You may specify an answer speed only for DH11s, DHV11s, DZ11s, and DZV11s, which are variable-speed multiplexers. (You cannot specify an answer speed for DL11s or DLV11s.)

Valid speeds for the DH11 are 0, 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, EXTA (user-specified baud rate A), and EXTB (user-specified baud rate B).

Valid speeds for the DHV11 are 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, and 19200.

SET (Cont.)

Valid speeds for the DZ11 and DZV11 are 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, and 9600.

When you omit =TTnn:, the system displays all the remote terminals. When you omit speed, the current setting for the terminal remains in effect.

Examples:

```
>SET /REMOTE
REMOTE=TT1:1200
REMOTE=TT2:0
REMOTE=TT4:0
```

Displays all the terminals that are currently set as remote dial-in lines.

```
>SET /REMOTE=TT3:1200
```

Sets the terminal line corresponding to TT3: as a remote dial-in line. The initial baud rate (answer speed) for the line will be 1200.

/NOREMOTE[=TTnn:]

Declares that the terminal's line is a local line not connected to a modem.

A nonprivileged user can display all local lines, but only a privileged user can declare a terminal as local.

When you omit =TTnn:, the system displays all the local lines (including DL11, DLV11, DH11, DHV11, DZ11, and DZV11 multiplexers).

Examples:

```
>SET /NOREMOTE=TT3:
```

Declares that the terminal line for TT3: is a local line.

```
>SET /NOREMOTE
NOREMOTE=TT0:
NOREMOTE=TT3:
```

Displays all the local lines (including DL11, DLV11, DH11, DHV11, DZ11, and DZV11 multiplexers).

/RNDC[=nn]

Defines the length of the Executive round-robin scheduling interval in ticks. The parameter nn can be an octal value, or decimal if followed by a period (.). The minimum value for nn is 0. See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for more information.

SET (Cont.)

A nonprivileged user can display the value for the interval, but only a privileged user can change the value.

When you omit =nn, the system displays the current value for the interval.

Examples:

```
>SET /RNDC
RNDC=6.
```

Displays the current length of the round-robin scheduling interval.

```
>SET /RNDC=10.
```

Sets the length of the interval to 10(10) ticks.

/RNDH[=nn]

Defines the highest priority (1 through 250 decimal) that will be considered for Executive round-robin scheduling. The class must be higher than the one specified with /RNDL. See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for more information.

A nonprivileged user can display the value for the priority, but only a privileged user can change the value.

When you omit =nn, the system displays the current value for the priority.

Examples:

```
>SET /RNDH
RNDH=150.
```

Displays the current highest priority class that is considered for round-robin scheduling.

```
>SET /RNDH=120.
```

Sets the highest priority class to 120(10).

/RNDL[=nn]

Defines the lowest priority (1 through 250 decimal) that will be considered for Executive round-robin scheduling. The class must be lower than the one specified with /RNDH. See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for more information.

A nonprivileged user can display the value for the priority, but only a privileged user can change the value.

When you omit =nn, the system displays the current value for the priority.

Examples:

```
>SET /RNDL
RNDL=1
```

Displays the current lowest priority class that is considered for round-robin acheduling.

```
>SET /RNDL=20.
```

Sets the lowest priority class to 20(10).

/RPA[=TTnn:]

(Full-duplex terminal driver only.) Enables the read-pass-all option of the terminal driver. The terminal driver passes all input characters (including special function characters such as CTRL/C) to the driver input buffer.

A nonprivileged user can display all terminals that have the option enabled but can only enable the read-pass-all option for TI:. A privileged user can enable the read-pass-all option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the read-pass-all option enabled.

Examples:

```
>SET /RPA
RPA=TT0:
RPA=TT1:
```

Displays all the terminals where input characters are passed directly to the input buffer for the full-duplex terminal driver.

```
>SET /RPA=TT3:
```

Enables the read-pass-all option for TT3:.

/NORPA[=TTnn:]

(Full-duplex terminal driver only.) Disables the read-pass-all option. The terminal driver does not pass special function input characters (such as CTRL/C) from the terminal to the driver input buffer.

A nonprivileged user can display all terminals that have the option disabled but can only disable the read-pass-all option for TI:. A privileged user can disable the read-pass-all option for any terminal.

When you omit =TTnn:, the system displays all the terminals that do not pass special function characters to the terminal driver input buffer.

SET (Cont.)

Examples:

```
>SET /NORPA
NORPA=TT2:
NORPA=TT4:
```

Displays all the terminals that have the read-pass-all option disabled.

```
>SET /NORPA=TT3:
```

Specifies that TT3: not pass special function input characters to the input buffer for the full-duplex terminal driver.

/SECPOL

(RSX-11M-PLUS systems only.) Displays secondary pool use on the system. The display is in the following format:

SECPOL-secfr:secsiz:pctfr

secfr

The number of free blocks in secondary pool in units of 32-word (decimal) blocks.

secsiz

The size of secondary pool in units of 32-word (decimal) blocks.

pctfr

The percentage of free blocks in secondary pool.

Example:

```
>SET /SECPOL
SECPOL=285.:640.:44%
```

Displays the amount of secondary pool currently being used.

/SERIAL[=TTnn:]

(RSX-11M-PLUS systems only.) Causes unsolicited input from the specified terminal to be processed serially rather than in parallel. Usually, if you enter another command line before a previous command line has completed executing, the system processes the second line in parallel with the first. When you request serial execution of command lines, however, the system processes the first command line and then the second command line after the first is finished.

A nonprivileged user can display all the terminals that have the serial option enabled but can only enable the option for TI:. Privileged users can enable the option for any terminal.

SET (Cont.)

When you omit =TTnn:, the system displays all the serial terminals.

Example:

```
>SET /SERIAL=TI:
>MAC TEST=TEST
TKB TEST=TEST
>
```

Sets TI: to be a serial terminal. MCR processes the MAC command line and then processes the TKB command line. If the terminal had not been set for serial execution, the TKB command line would have failed because TEST.OBJ would not have been created yet. Note that the TKB command line is not echoed until it is selected for execution.

/NOSERIAL[=TTnn:]

(RSX-11M-PLUS systems only.) Causes unsolicited input from the specified terminal to be executed in parallel rather than serially.

A nonprivileged user can display all the terminals that do not have the serial option enabled but can only disable the option for TI:. Privileged users can disable the option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the serial option disabled.

Examples:

```
>SET /NOSERIAL
NOSERIAL=TT1:
NOSERIAL=TT5:
NOSERIAL=TT20:
```

Displays all terminals that do not have the serial option enabled.

```
>SET /NOSERIAL=TT16:
```

Establishes TT16: as a terminal whose unsolicited command lines will be executed in parallel rather than serially.

/SLAVE[=TTnn:]

Establishes the specified terminal as one that can enter data only if it is solicited from a task by a READ QIO$. Thus, the specified terminal always rejects unsolicited input (other than CTRL/O, CTRL/Q, and CTRL/S).

A nonprivileged user can display all slave terminals but can only establish TI: as a slave terminal. Privileged users can establish any terminal as a slave terminal.

When you omit =TTnn:, the system displays all the terminals currently classified as slaved.

SET (Cont.)

Examples:

```
>SET /SLAVE=TT3:
```

Establishes TT3: as a terminal that can only enter data solicited by a task.

```
>SET /SLAVE
SLAVE=TT3:
```

Displays all the slaved terminals.

/NOSLAVE[=TTnn:]

Removes slave status from a specified terminal.

A nonprivileged user can only display the nonslaved terminals. A privileged user can set any slaved terminal to be nonslaved.

When you omit =TTnn:, the system displays all the nonslaved terminals.

Examples:

```
>SET /NOSLAVE
NOSLAVE=TT0:
NOSLAVE=TT1:
NOSLAVE=TT2:
NOSLAVE=TT4:
```

Displays all the nonslaved terminals.

```
>SET /NOSLAVE=TT3:
```

Sets TT3: to be nonslaved.

/SPEED=TTnn:[recv:xmit]

Establishes the receive and transmit baud rate for terminals attached to the system through a DH11, DHV11, DZ11, or DZV11 variable-speed multiplexer. The argument "recv" is the baud rate at which characters are input to the computer from the terminal and the argument "xmit" is the baud rate at which characters are output to the terminal from the computer. Both must be specified in setting the speed. If neither argument is specified, the current settings are displayed.

A nonprivileged user can display the speed settings for any terminal, but can only set the speed for TI:. A privileged user can set the speed for any terminal.

Valid baud rates for the DH11 are 0, 50, 75, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, EXTA (user-specified baud rate A), and EXTB (user-specified baud rate B).

SET (Cont.)

Valid baud rates for the DHV11 are 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 4800, 9600, and 19200.

Valid baud rates for the DZ11 and DZV11 are 50, 75, 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, and 9600.

If you have a DZ11 or DZV11, the receive and transmit baud rates must be the same because these multiplexers do not support split speeds.

SET (Cont.)

Examples:

```
>SET /SPEED=TT3:
SPEED=TT3:2400:2400
```

Displays the current speed setting for TT3:.

```
>SET /SPEED=TT3:9600:9600
```

Sets the receive and transmit baud rates for TT3: to 9600.

/SUB=mname:sname[:base:size]

(RSX-11M systems only.) Establishes a subpartition. Subpartitions can only be established in user-controlled main partitions.

mname

The 1- to 6-character main partition name. The subpartition being defined becomes a subpartition in this partition.

:sname

The 1- to 6-character subpartition name. The subpartition being defined becomes a subpartition of the main partition specified in mname.

:base

The physical base address of the subpartition, specified as a number of 64-byte blocks.

:size

The size of the subpartition, specified as a number of 64-byte blocks.

Base and size can be entered in any of the following formats (nnnn is a number in bytes to which the system applies a multiplication factor to determine the value used):

Format	Calculated Value
nnnn	Octal (nnnn*100)
nnnn.	Decimal (nnnn.*64.)
nnnK	Octal K (nnn*4000)
nnn.K	Decimal K (nnn.*2048.)

Valid ranges for calculated values (in words) are:

Octal	0<=base<10000	0<size<2000
Decimal	0.<=base<4096.	0.<size<1024.
Octal K	0K<=base<200K	0K<size<40K
Decimal K	0.K<=base<2047.K	0.K<size<32.K

SET (Cont.)

For example, any of the following inputs for size will allocate a 2048(10)-byte partition.

```
40
32.
1K
1.K
```

When you omit base and size, the system displays the current values for the named subpartition.

Example:

```
>SET /SUB=SYSPAR:MCRPAR:445:56
```

Defines a subpartition named MCRPAR in the main partition SYSPAR. The base address for MCRPAR is 44500(8) and its length is 5600(8) bytes.

/NOSUB=mname:sname

(RSX-11M systems only; privileged option.) Eliminates the named subpartition (sname) from the specified main partition (mname).

Example:

```
>SET /NOSUB=SYSPAR:MCRPAR
```

Eliminates the subpartition MCRPAR from the main partition SYSPAR.

/SWPC[=nn]

Defines the number of clock ticks for a single Executive swapping interval. The parameter nn is in the range 0 through 45,568(10) and can be an octal value, or decimal if followed by a period (.). See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for more information.

A nonprivileged user can display the value for the interval, but only a privileged user can change the value.

When you omit =nn, the system displays the current value for the interval.

Examples:

```
>SET /SWPC
SWPC=30.
```

Displays the current number of clock ticks for the swapping interval.

```
>SET /SWPC=60.
```

Sets the new swapping interval to 60(10).

SET (Cont.)

/SWPR[=nn]

Defines a priority range for Executive swapping. The parameter nn is in the range 0 through 127(10) and can be an octal value, or decimal if followed by a period (.).

The value for /SWPR affects the installed priority of all tasks. Each task is initiated at its installed priority plus the value for nn (priority + nn). While the task is executing, its priority is decremented until it becomes the installed priority minus the value for nn (priority - nn). When the priority reaches this lower limit, the task is swapped out so that another task with a higher priority can execute. The priority for the new task changes in the same way. See the RSX-11M or RSX-11M-PLUS System Generation and Installation Guide for more information.

A nonprivileged user can display the value for the priority, but only a privileged user can change the value.

When you omit =nn, the system displays the current value for the priority range.

Examples:

```
>SET /SWPR
SWPR=5.
```

Displays the current value for the swapping priority range.

```
>SET /SWPR=10.
```

Sets the new priority range to 10(10).

/SYSUIC[=[uic]]

Establishes the UIC for the system and all system tasks. On most unmapped systems, the system UIC is [1,50]; on most mapped systems, the system UIC is [1,54]. These UIC values are the initial defaults on virgin systems. The UIC also becomes the default UIC used by the LOAD command and the install-run-remove option of the RUN command.

A nonprivileged user can display the system UIC, but only a privileged user can change it.

When you omit =[uic], the system displays the current system UIC.

Examples:

```
>SET /SYSUIC
SYSUIC=[1,54]
```

Displays the current system UIC.

```
>SET /SYSUIC=[3,54]
```

Sets the system UIC to [3,54].

SET (Cont.)

/TERM=TTnn:[value]

(Full-duplex terminal driver only.) Establishes the terminal type (value) for the specified terminal. Supported standard terminal types are:

ASR33	LA30S	LA120	VT55	VT105
ASR35	LA34	LA180S	VT61	VT125
KSR33	LA36	VT05B	VT100	VT131
LA12	LA38	VT50	VT101	VT132
LA30P	LA100	VT52	VT102	

A nonprivileged user can display the terminal type for any terminal but can only establish the terminal type for TI:. A privileged user can establish the terminal type for any terminal.

When you omit the value parameter, the system displays the terminal type for the specified terminal.

MCR also accepts an alternate form of the command. You can specify the terminal type and equate it to the desired terminal. This automatically associates certain characteristics of the particular terminal type with the specified terminal. (See the RSX-11M/M-PLUS I/O Drivers Reference Manual for a list of the implicit characteristics for each terminal type.) The command is in the format:

SET /term-type=TTnn:

where term-type is one of the standard terminal types. Note that the terminal types are mutually exclusive.

The half-duplex terminal driver also accepts the /term-type form of the command. However, the only legal terminal types for the half-duplex driver are /ASR33, /LA30S, and /VT05B. The command associates implicit characteristics of the terminal type with the specified terminal, but, unlike the full-duplex terminal driver, the types are not mutually exclusive.

The following list describes the effects of the keywords for the half-duplex terminal driver:

/ASR33 Converts lowercase letters to uppercase before they are output to the terminal.

/LA30S Indicates that fill characters necessary for the LA30S terminal are used after a carriage return. The number of fill characters used depends on the current carriage position at the time the carriage return occurs.

/VT05B Sets a vertical fill of three nulls after a line feed on 60 Hz systems and of four nulls on 50 Hz systems.

SET (Cont.)

Examples:

```
>SET /TERM=TT3:
TERM=TT3:VT52
```

Displays the terminal type for TT3:.

```
>SET /TERM=TT1:LA36
```

Establishes TT1: as an LA36 terminal.

```
>SET /LA36=TT1:
```

Same effect as previous example; establishes TT1: as an LA36 terminal.

You can also use an alternate command form to display all the terminals that are not of a specific type. The format is as follows:

```
SET /NOterm-type
```

Note that you cannot negate a terminal type for a terminal. You can only display the terminals not of a specific type. Negating terminal type returns a syntax error since the terminal would be of indeterminate type.

/TOP=pname:value

Directs MCR to move the top boundary of the specified system-controlled partition up or down the amount indicated by the value parameter, or sets the partition size to that amount. The keyword modifies the top boundary of a partition even if the partition has tasks installed in it. If you modify the partition so that it may be too small to hold the tasks installed in it, MCR displays a warning message but modifies the partition anyway.

pname

The 1- to 6-character alphanumeric name for the system-controlled partition.

value

The number of 64-byte blocks.

The value parameter can be supplied in five formats: +value, -value, value, +* or *, and -*.

SET (Cont.)

+value

Moves the top boundary up by the specified amount. Moving the top boundary up makes the partition larger.

NOTE

You can supply the value in the same units as the base and size parameters in the /MAIN or /PAR keywords described previously.

-value

Moves the top boundary down by the specified amount. Moving the top boundary down makes the partition smaller.

value

Establishes the total partition size equal to the specified value by moving the top boundary.

+* or *

Moves the top boundary up as far as possible. This format causes the top boundary to move to the bottom boundary of the partition above it or to the top of memory if the partition is the top partition in memory.

-*

Moves the top boundary down as far as possible. This format causes the top boundary to move down to the top of the first fixed task, common, or driver in the partition at the time the /TOP keyword is executed. If nothing is loaded into the partition, the partition assumes a size of one 64-byte block.

Examples:

```
>SET /TOP=TSTPAR:+5
```

Moves the top boundary of TSTPAR up by five 64-byte blocks.

```
>SET /TOP=PAR23:-*
```

Moves the top boundary of PAR23 down as far as possible.

SET (Cont.)

/TYPEAHEAD[=TTnn:[size]]

(Full-duplex terminal driver only.) Instructs the terminal driver to store input characters in a buffer before passing the characters to a requesting task. Thus, characters input between requests are not lost.

If size is specified (RSX-11M-PLUS systems that support kernel data space only), the typeahead buffer size is set accordingly. The value for size can be from 0 through 255(10). If you specify 0 or 1, the terminal will not have the typeahead option enabled (same effect as /NOTYPEAHEAD). The default for size is 86(10).

A nonprivileged user can display all terminals that have the typeahead option enabled but can only enable the option for TI:. A privileged user can enable typeahead for any terminal. These rules also apply to the size of the typeahead buffer.

When you omit =TTnn:, the system displays all the terminals that have typeahead enabled.

Examples:

```
>SET /TYPEAHEAD
TYPEAHEAD=TT1:
TYPEAHEAD=TT2:
TYPEAHEAD=TT7:
TYPEAHEAD=TT12:
```

Displays all the terminals for which the terminal driver stores input characters in a buffer before passing them to a task.

```
>SET /TYPEAHEAD=TT3:
```

Enables the typeahead option for TT3:.

/NOTYPEAHEAD[=TTnn:]

(Full-duplex terminal driver only.) Disables the typeahead option; the terminal driver does not store input characters in a buffer to prevent their loss.

A nonprivileged user can display all terminals that have the typeahead option disabled but can only disable the option for TI:. A privileged user can disable typeahead for any terminal.

When you omit =TTnn:, the system displays all the terminals that have typeahead disabled.

SET (Cont.)

Examples:

```
>SET /NOTYPEAHEAD
NOTYPEAHEAD=TT0:
NOTYPEAHEAD=TT4:
```

Displays all the terminals that have typeahead disabled.

```
>SET /NOTYPEAHEAD=TT3:
```

Disables the typeahead option for TT3:.

/UIC[=[uic][:TTnn:]]

Establishes the specified UIC as the default UIC for the terminal. Unless TTnn: is specified, the default UIC is set for TI:. If the system supports multiuser protection (some RSX-11M and all RSX-11M-PLUS systems) and you are a privileged user, the command also sets the terminal's protection UIC (see Section 2.2.1).

In a single-user system, all tasks run from the terminal are run with the UIC of the terminal. In a multiuser protection system, a privileged user can override the terminal UIC with the /UIC keyword for the RUN command. External MCR function tasks are also requested with the terminal's UIC. These tasks are the MCR MOUNT, INSTALL, DISMOUNT, and UFD commands (which run as tasks) and all system-supplied software.

A nonprivileged user can only display and change the default UIC for TI:. A privileged user can display and change the default UIC for any terminal.

When you omit =[uic], the system displays the current default UIC for TI:. When you omit =[uic] but specify =TTnn:, the system displays the current default UIC for that terminal.

Examples:

```
>SET /UIC
UIC=[10,10]
```

Displays the current default UIC for terminal TI:.

```
>SET /UIC=[303,3]
```

Sets the default UIC for terminal TI: to [303,3].

```
>SET /UIC=TT12:
UIC=[12,20]
```

Displays the current default UIC for TT12:.

SET (Cont.)

/VFILL[=TTnn:]

(Full-duplex terminal driver only.) Enables the vertical fill characters option for the specified terminal. The option instructs the terminal driver to add four fill characters following each line feed.

A nonprivileged user can display all terminals that have the vertical fill characters option enabled but can only enable it for TI:. A privileged user can enable the option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the vertical fill characters option enabled.

Examples:

```
>SET /VFILL
VFILL=TT0:
VFILL=TT1:
```

Displays all the terminals that have the vertical fill characters option enabled.

```
>SET /VFILL=TT3:
```

Instructs the full-duplex terminal driver to add four fill characters following each line feed at TT3:.

/NOVFILL[=TTnn:]

(Full-duplex terminal driver only.) Disables the vertical fill characters option for the specified terminal.

A nonprivileged user can display all terminals that have the vertical fill characters option disabled but can only disable it for TI:. A privileged user can disable the option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the vertical fill characters vertical fill characters option disabled.

Examples:

```
>SET /NOVFILL
NOVFILL=TT2:
NOVFILL=TT4:
```

Displays all the terminals that have the vertical fill characters option disabled.

```
>SET /NOVFILL=TT3:
```

Disables the option for TT3:.

SET (Cont.)

/WCHK[=ddnn:]

Specifies that all write operations are to be followed by a write check for all Files-11 disk devices except DX: and DY:. The checks assure the reliability of data transfers to the specified disk. However, writing is slowed because there are two I/O operations instead of just one.

On RSX-11M, Executive support for write checking is a system generation option and must be selected for this command to have any effect. On RSX-11M-PLUS, support for write checking is always included.

A nonprivileged user can only display the devices that have write checking enabled. A privileged user can enable write checking for any device that supports it.

When you omit =ddnn:, the system displays all the Files-11 disk devices that have write checking enabled.

Examples:

```
>SET /WCHK
WCHK=DB0:
WCHK=DK0:
```

Displays all the Files-11 disk devices that have write checking enabled.

```
>SET /WCHK=DK1:
```

Enables write checking for DK1:.

/NOWCHK[=ddnn:]

Specifies that write checking is to be disabled for the specified device.

A nonprivileged user can only display the devices that have write checking disabled. A privileged user can disable write checking for any device.

When you omit =ddnn:, the system displays all the Files-11 disk devices except DX: and DY: that have write checking disabled.

Examples:

```
>SET /NOWCHK
NOWCHK=DB1:
```

Displays all the devices that support write checking but have it disabled.

```
>SET /NOWCHK=DK1:
```

Disables write checking for DK1:.

SET (Cont.)

/WRAP[=TTnn:]

(Full-duplex terminal driver only.) Enables the wrap-around option. The wrap-around option instructs the terminal driver to generate a carriage return/line feed sequence when the number of input characters exceeds the terminal's buffer size. The carriage return/line feed sequence is transparent and does not appear in the input buffer.

A nonprivileged user can display all terminals that have the wrap-around option enabled but can only enable it for TI:. A privileged user can enable wrap-around for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the wrap-around option enabled.

Examples:

```
>SET /WRAP
WRAP=TT1:
WRAP=TT2:
```

Displays all the terminals for which a carriage return/line feed sequence is generated following an input string that exceeds the terminal's buffer size.

```
>SET /WRAP=TT3:
```

Enables the wrap-around option for TT3:.

/NOWRAP[=TTnn:]

Disables the wrap-around option; the terminal driver does not accept input characters beyond the buffer size for the terminal.

A nonprivileged user can display all terminals that have the wrap-around option disabled but can only disable it for TI:. A privileged user can disable the option for any terminal.

When you omit =TTnn:, the system displays all the terminals that have the option disabled.

Examples:

```
>SET /NOWRAP
NOWRAP=TT0:
NOWRAP=TT4:
```

Displays all the terminals that have the wrap-around option disabled.

```
>SET /NOWRAP=TT3:
```

Disables the wrap-around option for TT3:.

SET (Cont.)

Notes on Memory Allocation Keywords (see Table 3-3):

- If a partition contains an installed task common or loaded driver and a keyword (for example, /NOMAIN or /NOSUB) attempts to eliminate the partition, the system rejects the command.

- On RSX-11M systems, a keyword that eliminates a main partition also eliminates all its subpartitions. A keyword that eliminates a specified subpartition eliminates only that specified subpartition.

- On RSX-11M systems, if a keyword attempts to eliminate a main partition that has subpartitions in which tasks are installed, the system rejects the keyword until those tasks are removed from the subpartitions.

- When defining a main partition or a subpartition, the name must not already be defined as a partition. In addition, a main partition cannot overlap any other main partition, nor can a subpartition of a main partition overlap any other subpartition of the main partition. An exception is for DEV partitions, which can overlap. Subpartitions cannot be created on the I/O page.

- On RSX-11M systems, all partitions except the resident loader partition, LDRPAR, are considered to be user partitions by the /POOL keyword. Thus, for example, SYSPAR is considered to be a user partition.

- Once you allocate space to the dynamic storage region (pool), the space can never be recovered for use in partitions.

- System-controlled partitions cannot include subpartitions explicitly defined by the SET command. An attempt to define subpartitions in system-controlled partitions in this way will be rejected. The Executive dynamically defines subpartitions in a system-controlled partition as they are needed for tasks installed in the partition.

Command Error Messages:

SET -- ALIGNMENT ERROR

An attempt was made to create a partition, but the base address or size conflicted with existing partitions or physical memory size.

SET -- CANNOT REMOVE EXECUTIVE COMMON

The executive commons (on systems that support executive partitions) cannot be removed from the running system. The executive commons must be installed and removed with VMR (see the RSX-11M/M-PLUS System Management Guide).

SET -- CLI IS RESTRICTED

An attempt was made to set a terminal to a CLI, but the CLI was initialized with the /RESTRICT subkeyword. This means that only the CLI itself can set a terminal to the CLI.

SET (Cont.)

SET -- CLI REQUIRES THE TERMINAL TO BE LOGGED IN

An attempt was made to set a terminal to a CLI, but the terminal is not logged in. The CLI will only accept commands from logged-in terminals.

SET -- DEVICE BUSY

An attempt was made to set a terminal characteristic for a terminal that is busy (attached).

SET -- DEVICE NOT TERMINAL

An attempt was made to set terminal characteristics for a device that is not a terminal.

SET -- DEVICE NOT VARIABLE SPEED MULTIPLEXER

An attempt was made to set the baud rate for a terminal that was not attached to a DH11, DHV11, DZ11, or DZV11 multiplexer.

SET -- FEATURE NOT SUPPORTED

The command keyword specified a feature or device that is currently not incorporated into the system.

SET -- INVALID SPEED

The multiplexer line does not support the requested speed, or the command specified unequal receive and transmit baud rates for a DZ11 or DZV11. The DZ11 and DZV11 do not support split speeds.

SET -- LINE NOT DZ11

The command attempted to set to remote a line that was not attached to a DZ11 multiplexer.

SET -- NON EXISTENT MEMORY

An attempt was made to define a partition in nonexistent memory.

SET -- OVERLAP SEEKS NOT SUPPORTED

(RSX-11M-PLUS systems only.) The command attempted to enable overlapped seek support for other than a DM or RM device controller.

SET -- PARTITION ALREADY EXISTS

An attempt was made to define a partition with a name already in use.

SET -- PARTITION NOT SYSTEM-CONTROLLED

An attempt was made to move the top boundary of a partition with the /TOP keyword. This can be done only with system-controlled partitions.

SET (Cont.)

SET -- SPACE USED

An attempt was made to create a partition or subpartition in a storage area already occupied.

SET -- TASK INSTALLED IN PARTITION

An attempt was made to eliminate a partition or subpartition that contains installed tasks.

SET -- TOO MANY SUBPARTITIONS

(RSX-11M systems only.) An attempt was made to define more than seven subpartitions. A partition is limited to a maximum of seven subpartitions.

SET -- UNKNOWN MAIN PARTITION

(RSX-11M systems only.) An attempt was made to define a subpartition in a nonexistent main partition.

SET -- USER PARTITION >32K NOT PERMITTED

(RSX-11M systems only.) The command attempted to create a partition greater than 32K. User-controlled partitions greater than 32K cannot be created in systems that do not support extended logical address space, a system generation option.

SET -- VIRTUAL TERMINAL ERROR

(RSX-11M-PLUS systems only.) An attempt was made to set a terminal characteristic for a virtual terminal. This cannot be done.

SET -- WRITE CHECK NOT SUPPORTED

An attempt was made to enable write checking on a device that does not support it. See the description of the /WCHK keyword for the valid devices.

SSM

SYSTEM SERVICE MESSAGE (P)

The SSM command inserts text into the error log file. The text appears in error log reports produced by the error log report generator.

For information on the report generator, see the RSX-11M/M-PLUS Error Logging Manual.

Format:

SSM message

message

Any text string up to a maximum of 79 characters.

Example:

>SSM TESTING VOLUME INTEGRITY ON DK1:, POSSIBLE FORMAT ERRORS.

Inserts the message into the error log file.

[redacted]

The [redacted] command is valid only in [redacted] multiprocessing systems.

The [redacted] command either displays the current value of, sets, or clears a bit in the switch register. Diagnostic functions use the values in the switch register to determine diagnostic processing and to select specific diagnostics to execute.

Formats:

```
[redacted]
[redacted] value
[redacted] /bitposition/keyword
```

value

An octal number. When you include a value, the command deposits this number into the switch register.

bitposition

The bit number (0 through 15). The command sets, clears, or displays the value of the specified bit.

/keyword

One of the following:

/SET Sets bit in bitposition

/CLE Clears bit in bitposition

/DIS Displays value of bit in bitposition

Examples:

```
>SWR
177660
```

Displays the current value of the switch register.

```
>SWR 177660
```

Deposits 177660 into the switch register.

```
>SWR 3/SET
```

Sets the bit in bit position 3 (changes the switch register value in the previous example to 177664).

TAL

TASKLIST - ATL FORMAT (NP)

The TAL command displays the names and status of all tasks or of a specific task installed in the system. The display format is the same as that of the ACTIVE TASK LIST (ATL) command. See the ATL command for a description of the printout.

Format:

```
TAL [taskname]
```

taskname

The name of a specific task.

Examples:

RSX-11M systems

```
>TAL
LDR... 112050  LDRPAR 112404 00253100-00255600  PRI - 248.  DPRI - 248.
   STATUS:  -CHK FXD STP -PMD PRV NSD
   TI - C00:  IOC - 0.  BIO - 0.  EFLG - 000001 000000  PS - 170000
   PC - 120354 REGS 0-6 120212 010364 177777 107646 074714 107614 120166
RMDEMO 053550  GEN    046020 01036700-01065600  PRI - 225.  DPRI - 225.
   STATUS:  -CHK WFR -PMD PRV MCR
   TI - TT0:  IOC - 0.  BIO - 0.  EFLG - 000021 040000  PS - 170010
   PC - 125234 REGS 0-6 000000 136257 132066 000000 136321 134560 121166
F11ACP 111550  GEN    067150 01164600-01230600  PRI - 149.  DPRI - 149.
   STATUS:  STP ACP -PMD PRV NSD CAL
   TI - C00:  IOC - 0.  BIO - 0.  EFLG - 000002 000001  PS - 170000
   PC - 135244 REGS 0-6 000010 000066 000016 000000 067420 111550 120244
MCR... 110160  SYSPAR 114514 00202600-00212600  PRI - 160.  DPRI - 160.
   STATUS:  STP -PMD PRV MCR CLI NSD CAL
   TI - TT51:  IOC - 0.  BIO - 0.  EFLG - 000001 040000  PS - 170000
   PC - 122436 REGS 0-6 000000 120476 122032 120432 010554 043552 120366
```

RSX-11M-PLUS systems

```
>TAL
...RMD 006246+ GEN    114020 00741000-00770200  PRI - 225.  DPRI - 225.
   STATUS:  -EXE -CHK -PMD PRV PRO XHR
   TI - NONE  IOC - 0.  BIO - 0.  EFLG - 001400 000000
...DMO 006224+ GEN    114020 00741000-00756500  PRI - 160.  DPRI - 160.
   STATUS:  -EXE -PMD PRV PRO
   TI - NONE  IOC - 0.  BIO - 0.  EFLG - 001326 000000
```

On RSX-11M-PLUS, the plus sign (+) following the TCB field for a task indicates that the task is installed in secondary pool. In the TAL display, these tasks follow the tasks installed in primary pool.

TAS

TASKLIST (NP)

The TASKLIST command displays a description of each installed task. The display contains:

1. Task name
2. Task version identification
3. Partition name
4. Task priority
5. Size of task in bytes (octal)
6. Load device identification
7. Disk address logical block number (octal)
8. Task memory state

On RSX-11M-PLUS, the display lists the tasks installed in primary pool and then those installed in secondary pool.

Format:

```
TAS[KLIST] [taskname][/DEV=ddnn:]
```

taskname

The name of a specific task.

/DEV=ddnn:

Displays the names and status of all tasks installed from the specified device.

If you specify both taskname and /DEV, the system displays information about the task installed from that device.

Examples:

```
>TAS
LDR... 07.05   LDRPAR 248. 00002200 LB0:-01035303 FIXED
TKTN   03.3    SYSPAR 248. 00010000 LB0:-01126742
RMDEMO X03.03  GEN    225. 00013700 SY0:-00352100
MTAACP 0006    GEN    200. 00013000 DS0:-00000777
F11MSG V0010   GEN    200. 00005400 SY0:-01053030
MCR... 3.2     SYSPAR 160. 00010000 LB0:-01051626
TAST17 01      GEN    160. 00025000 LB0:-01051676
...STO 000005  SYSPAR 151. 00010000 SY0:-01136540
...BYE 01.5    GEN    150. 00040000 LB0:-01051337
F11ACP M0235   FCPPAR 149. 00040000 LB0:-01052445
SECFCP M0235   GEN    149. 00026200 SY0:-00055463
DTAACP M0235   GEN    149. 00026200 SY0:-01052554
...DMO 03.2    GEN    140. 00040000 LB0:-01051403
...INI 03.1    GEN    140. 00040000 LB0:-01051561
```

TAS (Cont.)

```
...MOU 03.01   GEN     140. 00040000 LB0:-01051653
...UFD V0407   GEN     140. 00040000 LB0:-010

(User typed CTRL/O to suppress further output.)

>TAS /DEV=DR0:
DR00F1 M0323   SYSPAR 149. 00055700 LB0:-00475656 FIXED
F11ACP M0323   GEN     149. 00044000 LB0:-00315566
DB01F1 M0323   GEN     149. 00044000 LB0:-00315566
DB07F1 M0323   SYSPAR 149. 00044000 LB0:-00315566 FIXED
ERRLOG V1.01   GEN     148. 00042200 LB0:-00335276
PMD... 04.0    GEN     140. 00015200 LB0:-00503535
HRC... 02      GEN     140. 00055100 LB0:-00505331
SYSLOG 1.02    GEN     130. 00016300 LB0:-00504250
...INS 06      GEN     100. 00035400 LB0:-00502750
```

The displays contain from left to right: task name, task version identification, partition name, task priority, task size, load device identification, logical block number on the load device, and task memory state. On a processor with less than 124K words of memory, the size field (fifth column) contains 6-digit rather than 8-digit numbers.

FIXED indicates that the task is fixed in memory.

CHECKPOINTED indicates that the task has been swapped out of memory to make room for a higher priority task.

If the task version identification is missing (the rest of the line is offset to the left) or garbage, the task was installed from a disk that has since been removed from the drive or replaced by another one.

Command Error Message:

TAS -- TASK NOT IN SYSTEM

The task specified in the command line is not currently installed in the system.

TIM

TIME (NP,P)

The TIME command allows you to:

- Set the current time of day (privileged)
- Set the current date (privileged)
- Display the current time and date

Format:

TIM[E] [hrs:mins[:secs]] [m1/day/year]

or

TIM[E] [hrs:mins[:secs]][day-m2-year]

hrs

Hours in the range 0 through 23.

mins

Minutes in the range 0 through 59.

secs

Seconds in the range 0 through 59 (optional parameter).

m1

Numeric representation of the month in the range 1 through 12.

m2

Three-letter abbreviation for the month.

day

Day in the range 1 through 31.

year

Year in the range 0 through 99. The year is relative to 1900, thus 1981 is entered as 81.

Notes:

- When the command specifies neither time nor date, the system displays the current time and date on the entering terminal.
- If a privileged user specifies the time and date, the command sets the clock and calendar. If only the time is specified, only the clock is set; if only the date is specified, only the calendar is set.

TIM (Cont.)

- A privileged user can specify the time and date in either order.
- The form used to specify the date does not affect the display format. The date is always displayed as day-month-year.
- All numeric values are decimal. No terminating period is necessary (or permitted).

Examples:

```
>TIM
10:23:31 26-MAR-81
```

Displays the current time and date.

```
>TIM 11:37 4/19/81
```

Sets the time to 11:37:00 and the date to 19-Apr-81.

UFD

USER FILE DIRECTORY (NP,P)

The UFD command creates a User File Directory (UFD) on a Files-11 volume and enters its name into the Master File Directory (MFD). (See Section 2.1.1 for further information about UFDs.)

Before creating a UFD, you must first initialize and mount (INI and MOU) the volume.

On multiuser protection systems, a nonprivileged user can create a UFD only on a volume mounted on a privately allocated device. A privileged user can create a UFD on any mounted volume.

Format:

```
UFD ddnn:[volume-label][g,m][/keyword(s)]
```

ddnn:

Device unit containing the volume on which the UFD being created will reside.

Default: none; must be specified.

volume-label

If specified, the label is compared with the label on the volume. If the names match, a UFD can be created. If they do not match, the command is rejected.

Default: null; no check is made.

[g,m]

The UIC for the UFD. The UIC establishes the owner of the UFD. The variables g and m represent the group and member numbers, respectively, and can be in the range 1 through 377(8). The square brackets are required syntax.

Default: none; must be specified.

/ALLOC=number

The number of directory entries for which space in the UFD is to be allocated. The specified number is rounded up to the next multiple of 32(10).

Default: 32(10)

/PRO=[system,owner,group,world]

Establishes access rights for the directory file. Access codes consist of four 4-code groups in the access rights word, as follows:

R - Read
W - Write
E - Extend
D - Delete

UFD (Cont.)

In each instance, the absence of the code means that the user class is denied the access right.

The square brackets are required syntax.

Defaults: [RWED,RWED,RWED,R]

Example:

>UFD DM1:[1,1]

Creates a user file directory (UFD) for the UIC [1,1] on DM1:. The name and file number of the UFD file are entered into the MFD. The name of the UFD is 001001.DIR;1, and its owner is UIC [1,1].

Command Error Messages:

UFD -- CAN'T READ MCR COMMAND BUFFER

The UFD was initiated by a RUN command rather than as an MCR command.

UFD -- DIRECTORY ALREADY EXISTS

The requested UFD already existed on the volume.

UFD -- FAILED TO CREATE DIRECTORY

No space existed on the volume or an I/O error occurred.

UFD -- FAILED TO ENTER IN MFD

There was no room in the MFD or on the volume, or an I/O error occurred on the volume.

UFD -- HOME BLOCK I/O ERROR

An error was detected while the volume home block was being read.

UFD -- NOT FILES-11 DEVICE

The volume on which the UFD was to be created was not a Files-11 volume and therefore could not support UFDs.

UFD -- VOLUME NOT MOUNTED

The volume on which a UFD is to be created must be mounted.

UFD -- WRITE ATTRIBUTES FAILURE

An error was encountered while the attributes of either the MFD or the newly created UFD were being written.

UFD -- WRONG VOLUME

The volume label and the label specified in the command line did not match.

UNB

UNBLOCK (NP,P)

The UNBLOCK command continues the execution of a previously blocked active task or allows a previously blocked dormant task to execute if it is requested to do so. (See the description of the BLOCK command.)

On systems with multiuser protection, a nonprivileged user can unblock any active task running from the issuing terminal. A privileged user can unblock any task. On systems without multiuser protection, any user can unblock any task.

The system automatically unblocks an active task when it is aborted.

Format:

UNB[LOCK] [taskname][/TERM=TTnnn:]

taskname

The name of the task. If you omit taskname, the command unblocks the task requested from the issuing terminal (task TTnn).

/TERM=TTnnn:

A privileged RSX-11M-PLUS keyword that clears the block bit for a task being run from the specified terminal.

Examples:

>UNB TST

Unblocks task TSTT36 and allows it to continue executing. (TT36: is the number of the terminal from which the task is running.)

>UNB MAS/TERM=TT23:

Unblocks task MAST23 and allows it to continue executing.

UNF

UNFIX (P)

The UNFIX command frees a fixed task from memory. This allows tasks that have been waiting for the partition in which the fixed task resides to compete for the partition. However, if a fixed task exits or aborts, it still occupies the physical memory in the partition.

UNFIX is the complement of the FIX command.

Format:

UNF[IX] taskname

taskname

The name of the task.

On RSX-11M-PLUS systems, the UNFIX command accepts two keywords that allow users to free common task regions from a partition. These keywords are:

/REG - Unfix a common region

/RON - Unfix the read-only segment of a multiuser task

Formats:

UNF[IX] region-name/REG

UNF[IX] taskname/RON

When freeing a common, read-only segment of a multiuser task, you must type the full name of the multiuser task.

Examples:

>UNFIX XKE

Unfixes task XKE, freeing the partition in which it resides for task competition.

>UNF FCSRES/REG

Frees the resident library for FCS from its partition.

>UNFIX ...MAC/RON

Unfixes the read-only segment of the MACRO-11 Assembler from its partition.

Command Error Message:

UNF -- TASK NOT FIXED

An attempt was made to unfix a task that was not fixed.

UNL

UNLOAD (P)

The UNLOAD command removes a loadable device driver from memory. If a device is mounted, attached, or has outstanding I/O, its driver cannot be unloaded. Also, the UNLOAD command cannot remove a data base from memory, even if the data base was loaded by means of the LOAD command.

To unload a device driver from memory, the driver's symbol table (STB) file must reside on the system device (LB:) under the system UIC. The SET /SYSUIC command displays and defines the system UIC, but usual values are [1,50] for unmapped systems and [1,54] for mapped systems.

Format:

UNL[OAD] dd:

dd:

A 2-character ASCII device name.

Example:

>UNL LP:

Unloads the loadable device driver for device LP:.

Command Error Messages:

UNL -- DEVICE ddnn: HAS UNITS ATTACHED, BUSY, AND/OR MOUNTED

An RSX-11M message. Device ddnn: is the first or only unit that is attached, mounted, and/or has outstanding I/O. Therefore, the driver cannot be unloaded.

UNL -- DEVICE dd: NOT IN SYSTEM

No such device exists in the system.

UNL -- DEVICE NOT MOUNTED

The system device (LB:) was not mounted.

UNL -- DRIVER BUILT WITH WRONG EXECUTIVE STB FILE

The STB file for the driver is not compatible with the current Executive.

UNL -- DRIVER CANNOT BE UNLOADED

The UNLOAD command attempted to remove a permanently resident device driver (that is, a driver built as part of the Executive).

UNL -- DRIVER NOT LOADED

The device driver specified in the UNLOAD command line was not resident in memory.

UNL (Cont.)

UNL -- FILE filename HAS ILLEGAL STB FORMAT

The driver's STB file contained illegal object code or data.

UNL -- ILLEGAL VALUE FOR SYMBOL symname IN FILE filename

The symbol symname is defined to an illegal value by the file ddDRV.STB. Since ddDRV.STB had to pass a previous inspection by the LOA command, there probably has been a procedural error or ddDRV.STB has been corrupted.

UNL -- LOADABLE DRIVER SUPPORT NOT IN SYSTEM

(RSX-11M systems only.) The option to support loadable device drivers was not chosen when the system was generated.

UNL -- SYMBOL symname IS DOUBLY DEFINED BY FILE filename

The symbol symname is defined twice in the specified file. Duplicate systems are illegal. The driver remains loaded.

UNL -- SYMBOL symname IS UNDEFINED BY FILE filename

The symbol symname was found in the specified file, but the symbol is not defined.

Additional RSX-11M-PLUS Error Messages

UNL -- DEVICE ddnn: IS ATTACHED, BUSY, ONLINE AND/OR MOUNTED

Device ddnn: is the first or only unit that is attached, on line, mounted, and/or has outstanding I/O. Therefore, the driver cannot be unloaded.

UNL -- KRB krbname IS NOT OFFLINE

All controllers of a device type must be off line before the driver can be unloaded. Issue an OFFLINE command to the reconfiguration facility (reconfiguration commands are described in the RSX-11M/M-PLUS System Management Guide).

UNS

UNSTOP (NP,P)

The UNSTOP command continues execution of a task that has been stopped internally by the Executive. Examples of stopped tasks are tasks that have issued a STOP$S or RCST$ (RECEIVE DATA OR STOP) directive.

A nonprivileged user can only unstop tasks being run from the issuing terminal. A privileged user can unstop any stopped task.

Format:

```
UNS[TOP] [taskname][/TERM=TTnnn:]
```

taskname

The name of the task. If you omit taskname, the command unstops the task being run from the issuing terminal (task TTnn).

/TERM=TTnnn:

A privileged RSX-11M-PLUS keyword that clears the stop bit for a task being run from the specified terminal.

Examples:

RSX-11M and RSX-11M-PLUS systems:

```
>UNS TST
```

Clears the stop bit for task TSTT17 and allows it to continue executing. (TT17: is the number of the terminal from which the task is running.)

RSX-11M-PLUS systems only:

```
>UNS LAR/TERM=TT131:
```

Clears the stop bit for task LARTD1 and allows it to continue executing. The task is being run from TT131: (TD1).

CHAPTER 4

THE INDIRECT COMMAND PROCESSOR

This chapter describes the Indirect Command Processor (Indirect) and indirect command files as well as the processor directives that control the execution of Indirect.

Note that parameter defaults and ranges for the Indirect directives are specified in the build file for the Indirect task. These values are installation-specific and can be changed. This facility also applies to initial command line and default UIC processing, which are discussed in Section 4.2. Ask your system manager for more information.

4.1 INDIRECT COMMAND FILES

There are two types of indirect command files: indirect task command files and indirect command line interpreter (CLI) command files. The following sections describe these files.

4.1.1 Indirect Task Command Files

An indirect task command file is a text file containing a list of task-specific command lines. Rather than retyping a commonly used sequence of commands, you can type the sequence once, store it in a file, and direct the task to read the file for its commands instead of prompting at the terminal. Tasks respond to commands contained in an indirect command file as if the commands were entered directly from the terminal. Most system-supplied tasks on RSX-11M/M-PLUS, such as MACRO-11 or the Task Builder, accept indirect task command files.

To initiate indirect task command files, replace the command line for a task with a file specification, preceded by an at sign (@). The task requesting input then accesses the specified file and starts to read and respond to the commands contained within it. For example, to initiate a file of MACRO-11 commands from MCR, input the following:

```
>MAC @INPT.CMD RET
```

The MACRO-11 Assembler accesses the file and then executes the command lines contained within the file INPT.CMD.

The default file type for indirect task command files is .CMD. Thus, the command line in the previous example could also be input as follows:

```
>MAC @INPT RET
```

Some tasks allow nested command files (one file invokes another). See the appropriate task documentation for the maximum nesting depth allowed.

Note that indirect task command files can only contain valid task-specific command lines. The Indirect directives (described in Section 4.6) cannot be used in such command files.

4.1.2 Indirect CLI Command Files

An indirect CLI command file is a text file containing a list of CLI-specific command lines and special directives that allow you to control command file processing (see Section 4.3). The indirect command processor (Indirect, which runs under the task name AT.) reads the indirect CLI command file, interprets the directives, and passes the CLI commands to the CLI.

To initiate an indirect CLI command file, enter the file specification, preceded by an at sign (@), whenever the CLI can accept input. For example:

```
>@CLIIPT.CMD RET
```

The default file type for indirect CLI command files is also .CMD. Thus, the command line in the previous example could also be input as follows:

```
>@CLIIPT RET
```

Indirect CLI command files can also be nested. The maximum level of nesting depends on the version of the Indirect task you are using. Ask your system manager about the version or look at the build file for the Indirect task.

Note that the Indirect directives described in this chapter can only be used in indirect CLI command files. All further references to indirect command files refer to CLI command files.

4.2 INDIRECT COMMAND PROCESSOR

When processing an indirect command file, the Indirect task (AT.) first reads the command file and interprets each command line either as a command to be passed directly to the CLI or as a request for action by Indirect. The directives to Indirect are distinguished by a period (.) as the first character in the line.

The Indirect directives form a procedural language that allows you to:

1. Define and assign values to logical, numeric, and string symbols
2. Substitute a symbol's value into any line of the command file
3. Perform arithmetic
4. Manipulate strings
5. Display text on the user's terminal
6. Ask questions of a user

7. Control the flow of a command file
8. Call subroutines
9. Detect error conditions
10. Test symbols and conditions
11. Create and access data files
12. Parse commands and data
13. Enable or disable any of several operating modes
14. Control time-based and parallel task execution

Two directives (.BEGIN and .END) permit you to block structure the command file and create Begin-End blocks. Modular, block-structured command files are easier to debug and maintain. More importantly, Begin-End blocks isolate local symbol definitions as well as labels and thus conserve symbol table space.

When you define a symbol, Indirect creates an entry for the definition in an internal symbol table. These symbol table entries retain their definitions throughout the execution of the command file if defined locally or throughout the execution of all levels of nested command files if defined globally. Local symbols defined within a block, however, retain their definitions only throughout the execution of the commands within that block; they are erased from the symbol table when Indirect encounters an .END directive.

An Indirect directive (.ENABLE GLOBAL; Section 4.6.12) allows the definition of some symbols as global to all file levels. Otherwise, each time Indirect enters a deeper level (and if the /LO switch has not been specified; Section 4.5), it masks all symbols defined by the previous level out of the symbol table so that only symbols defined in the current level are available. These symbols are local only to the level of the file in which they are defined. When control returns to a previous level, the symbols defined in that level become available once again and the ones from the lower level are lost.

When Indirect reaches the end of the highest level indirect command file, it displays the message (unless inhibited by the .DISABLE DISPLAY directive)

```
>@ <EOF>
```

and then exits.

Indirect displays on the requesting terminal every CLI command line as it is executed. However, if Indirect is activated by @filename/-MC or by @filename/-CLI, CLI command lines in the Indirect file are converted to comments with a leading exclamation point (!); the CLI command lines are displayed but not executed.

An Indirect file can also include comments, which the processor prints at the requesting terminal. Comments that begin a line interpreted by the CLI have a leading semicolon (;). (In some cases, the semicolon can be preceded on the same line by a directive to Indirect.) Comments that appear after the start of a CLI command line have a leading exclamation point (!). All lines in an indirect command file that begin with a period in column 1 followed by a semicolon (.;) are treated as comments but are not displayed when the file is processed.

Indirect attaches the terminal while processing contiguous comment lines that begin with a semicolon. This permits you to type CTRL/O and suppress a lengthy comment. Output is resumed by typing another CTRL/O or is resumed at the next CLI command line or Indirect directive statement in the command file.

Note that no command or comment lines are displayed if .ENABLE QUIET is in effect.

References to task names in an indirect command file follow the rules used for MCR and DCL. If the task was started as an external CLI task (for example, MAC, PIP, DMO), it may be referenced by its 3-character name (xxx). Thus, such directives as .IFINS, .IFACT, and .WAIT need only specify the 3-character task name; Indirect can then find the correct task. However, you can always refer to a specific task by using its full 6-character name (...xxx or xxxtnn).

If you do not specify a file name in the initial command line, Indirect can construct the name of a default file to be opened. The default file is named INDINIxxx.CMD, where xxx is null or the three-character task name that was used to initiate Indirect. Note, however, that this facility is currently disabled. To enable it, the value in the build file for the Indirect task must be changed.

If a specified command file cannot be found in the current UIC, Indirect can also search for the file in another UIC. However, to enable this facility, the value in the build file for the Indirect task must be changed to be nonzero. If the new value is 1, Indirect searches for the file in LB:[sysuic] on RSX-11M systems and in LB:[libuic] on RSX-11M-PLUS systems. If the new value is greater than 377(8), Indirect considers it to be the octal equivalent of the UIC (on LB:) to be searched.

4.3 SUMMARY OF INDIRECT DIRECTIVES

The Indirect directives described in this chapter are listed here by category. A detailed description of each directive is presented in alphabetical order in Section 4.6.

Label Definition

.label:	Assigns a name to a line in the command file so that the line may be referenced.

Symbol Definition

.ASK	Defines or redefines a logical symbol and assigns the symbol a true or false value.
.ASKN	Defines or redefines a numeric symbol and assigns the symbol a numeric value.
.ASKS	Defines or redefines a string symbol and assigns the symbol a character string value.
.ERASE	Deletes all local or global symbol definitions or a single global symbol definition.
.SETT/.SETF	Defines or redefines a logical symbol and assigns the symbol a true or false value.

.SETN	Defines or redefines a numeric symbol and assigns the symbol a numeric value.
.SETD/.SETO	Redefines the radix of a numeric symbol.
.SETL	Defines or redefines a logical symbol and assigns the symbol a true or false value.
.SETS	Defines or redefines a string symbol and assigns the symbol a character string value.

File Access

.DATA	Specifies a single line of data to output to a file.
.CHAIN	Closes the current indirect file and uses commands from another file.
.CLOSE	Closes a file.
.OPEN	Creates and opens an output data file (if the file exists, creates a new version and opens it).
.OPENA	Opens an existing file and appends subsequent data (does not create a new version). Defaults to .OPEN if the file does not exist.
.OPENR	Opens a file for reading with the .READ directive.
.PARSE	Parses strings into substrings.
.READ	Reads a record from a file into a specified string variable.

Logical Control

.BEGIN	Marks the beginning of a Begin-End block.
.END	Marks the end of a Begin-End block.
.EXIT	Terminates processing of either Indirect or the current command file, returns control to the invoking terminal or to the previous level, and optionally sets special symbol <EXSTAT> value.
.GOSUB	Calls a subroutine within the command file.
.GOTO	Branches to a label within the command file.
/	Defines logical end-of-file. Terminates file processing and exits. This directive is equivalent to the .STOP directive.
.ONERR	Branches to a label upon detecting a specific AT. error condition.
.RETURN	Effects an exit from a subroutine and returns to the line immediately following the subroutine call.

.STOP	Terminates indirect command file processing and optionally sets Indirect exit status. This directive is equivalent to the logical end-of-file (/) directive.

Logical Tests

.IF	Determines whether or not a symbol satisfies a condition.
.IFACT/.IFNACT	Determines whether or not a task is active.
.IFDF/.IFNDF	Determines whether or not a symbol is defined.
.IFENABLED/ .IFDISABLED	Tests the .ENABLE/.DISABLE options.
.IFINS/.IFNINS	Determines whether or not a task is installed in the system.
.IFLOA/.IFNLOA	Determines whether or not a device driver is loaded.
.IFT/.IFF	Determines whether a logical symbol is true or false.
.TEST	Tests the length of a string symbol or locates a substring.
.TESTDEVICE	Returns information about a device in the system.
.TESTFILE	Determines if a specified file exists and determines the physical device associated with a logical device name (performs device translation).
.TESTPARTITION	Returns information about a partition in the system.

Enable or Disable an Operating Mode

.ENABLE/.DISABLE	Enables or disables control of the following modes:

substitution
timeout parameter
lowercase
terminal attachment
data
global symbol
symbol radix
command line echo
command display
field display
command passing to default CLI
file deletion
truncate error suppression
escape
escape-sequence recognition
control-Z exit
overflow

Increment or Decrement Numeric Symbols

.DEC	Decrements the value of a numeric symbol by one.
.INC	Increments the value of a numeric symbol by one.

Execution Control

.DELAY	Delays the execution of an indirect command file for a specified period of time.
.PAUSE	Suspends the indirect command file processor and allows user action.
.WAIT	Waits for a specified task to complete execution and sets the special symbol <EXSTAT> with the completed task's exit status.
.XQT	Initiates a task, passes a command line to it, and continues indirect command file processing without waiting for the task to complete.

Special Purpose

.FORM	(RSX-11M-PLUS systems only.) Provides access to the FMS/RSX-11 V1.0 form driver. The directive allows FMS commands to be passed to FMS.

4.4 SYMBOLS

The indirect command processor enables you to define symbols. These symbols can then be tested or compared to control flow through the indirect command file. They may also be substituted in CLI commands, data records for data files, or comments to be displayed on the terminal.

Symbol names are ASCII strings from one through six characters in length. They must start with a letter (A through Z) or a dollar sign ($). The remaining characters must be alphanumeric or a dollar sign.

There are three symbol types:

- Logical
- Numeric
- String

A logical symbol has either a true or false value.

A numeric symbol can have a numeric value in the range of 0 through 65535(10). The symbol can be defined to have either a decimal or octal radix. The radix is relevant only when the symbol is substituted (see Section 4.4.2).

A string symbol has as its value a string of ASCII characters, with a length of 0 through 132(10) characters.

A symbol's type (logical, numeric, or string) is defined by the first assignment directive that assigns a value to the symbol. Assignment directives can assign:

- A true or false value to define a logical symbol (Defined by .ASK, .SETL, .SETT, or .SETF.)
- An octal or decimal number to define a numeric symbol (Defined by .ASKN, .SETN, .SETO, or .SETD.)
- A character string to define a string symbol (Defined by .ASKS, .READ, or .SETS.)

4.4.1 Special Symbols

Indirect automatically defines special symbols dependent upon specific system characteristics and the replies to queries presented during command file execution. As with symbols, special symbols can be compared, tested, or substituted and have three types: logical, numeric, and string. All special symbols have a common format: angle brackets (<>) enclose the special symbol name.

4.4.1.1 Special Logical Symbols - The special logical symbols are assigned a true or false value under the following circumstances:

Symbol	Value
<ALPHAN>	Set to true if last string entered in response to an .ASKS directive or tested with a .TEST directive contains only alphanumeric characters. An empty string also sets <ALPHAN> to true.
<ALTMOD>	Set to true if last question was answered with an ALTmode or ESCape. Otherwise, <ALTMOD> is set to false.
<BASLIN>	Set to true if the current operating system is a baseline configuration. (This option is used during system generation to determine what resources are available for the system generation process.) Otherwise, <BASLIN> is set to false.
<DEFAUL>	Set to true if answer to last query was defaulted (the RETURN key was pressed once) or a timeout occurred.
<EOF>	Set to true if the last .READ or .ASKx directive resulted in reading past the end of the file. Otherwise, <EOF> is set to false.
<ERSEEN>	Set to true if any of the following conditions are true (<ERRNUM>, <EXSTAT>, and <FILERR> are described in Section 4.4.1.2): • <FILERR> is less than 0, if a negative error code was returned

- If an exit status (<EXSTAT>) value worse than <WARNING> was returned
- <EOF> is set to true
- <ERRNUM> is not 0
- If you used the command line .SETT <ERSEEN>

The command line .SETF <ERSEEN> sets the following conditions:

- <FILERR> is set to 0
- <EXSTAT> is set to 0
- <EOF> is set to false
- <ERRNUM> is set to 0

<ESCAPE> Set to true if last question was answered with an ALTmode or ESCape. Otherwise, <ESCAPE> is set to false.

<FALSE> Logical constant used for comparisons with the .IF directive or as a default for the .ASK directive.

<IAS> Set to true if the current operating system is IAS. Otherwise, <IAS> is false. Always false in an RSX-11M/M-PLUS system.

<LOCAL> Set to true if the terminal from which Indirect is executing (TI:) is a local terminal. If the terminal is remote, <LOCAL> is set to false.

<MAPPED> Set to true if the system on which Indirect is running is mapped; set to false if the system is unmapped. Always true in an RSX-11M-PLUS system.

<NUMBER> Set to true if the last string entered in response to an .ASKS directive or tested with a .TEST directive contains only numeric characters. An empty string also sets <NUMBER> to true.

<OCTAL> Set to true if the answer to the last .ASKN directive or the radix of the numeric symbol tested in the last .TEST directive is octal or if the last string tested with a .TEST directive contained all numeric characters in the range 0 through 7.

<PRIVIL> Set to true if the current user is privileged. Its value is determined from the flag contained in the terminal data base. The flag is set at login or with the MCR SET /PRIVilege command.

<RAD50> Set to true if last string entered in response to an .ASKS directive or tested with a .TEST directive contains only Radix-50 characters. Radix-50 characters are the uppercase alphanumeric characters plus period (.) and dollar sign ($). A blank is not a Radix-50 character in this context. An empty string also sets <RAD50> true.

<RSX11D> Always false in an RSX-11M/M-PLUS system.

<TIMOUT> Set to true if timeout mode is enabled and the last .ASKx directive timed out waiting for a user response.

<TRUE> Logical constant used for comparisons with the .IF directive or as a default for the .ASK directive.

4.4.1.2 Special Numeric Symbols - The special numeric symbols are assigned the following values:

Symbol	Value
<ERRCTL>	Controls the way in which Indirect processes errors. The symbol is treated as an 8-bit mask. For each class of error that a user's .ONERR target routine processes (see Section 4.6.21), the appropriate bit is set in the mask. If the bit is clear, Indirect exits after printing the error information. If the eighth bit, which is the sign bit or 200(8), is set, Indirect does not print any information about the error. The initial default value for <ERRCTL> is 1, which implies that only class 1 errors can be handled with an .ONERR address and that error messages will be printed. Note that if you attempt to trap errors other than default class 1, processing cannot continue in most cases. The error service routine is limited to a fatal error message and .EXIT. The internal state of Indirect is indeterminate in all but class 1 error cases. See Section 4.8 for a list of error messages and their assigned class values.
<ERRNUM>	Assigned the class number of an error that Indirect has finished processing. This value can be used for processing specific error types with an .ONERR routine. See Section 4.8 for a list of error messages and their assigned class numbers.
<ERRSEV>	Assigned the error severity mask associated with the error that Indirect has finished processing. This bit mask corresponds to the bit mask <ERRCTL> used to control the processing.
<EXSTAT>	Assigned the value of 0, 1, 2, 4, or 17 depending on the exit status from the last CLI command line executed or from the last .WAIT taskname directive where taskname was activated by the .XQT directive.

This special numeric symbol is modified at the completion of a synchronous CLI command line or at the completion of a .WAIT directive. The .EXIT directive can also modify <EXSTAT>. The value is returned from the task that has completed if the task exits with status. Otherwise, the value is returned from the CLI. The values 0, 1, 2, 4, and 17 and their corresponding special symbols indicate:

0	<WARNIN>	Warning
1	<SUCCES>	Success
2	<ERROR>	Error
4	<SEVERE>	Severe error
17	<NOSTAT>	The task could not return exit status.

<FILERR> Assigned the FCS-11 or I/O driver status code resulting from a .TESTFILE, .OPENx, or .READ directive operation. See the RSX-11M/M-PLUS I/O Drivers Reference Manual for a description of the codes.

<FILER2> (RSX-11M-PLUS systems only.) Assigned the second error code word that is returned by the FMS-related commands.

<FORATT> Assigned the octal value of the file attributes that were used to open the data files.

<MEMSIZ> Assigned the value of the current system memory size in K words (K is 1024.).

<SPACE> Assigned the number, in octal, of free bytes in the internal symbol table for Indirect. The number does not reflect the amount of space that could be gained by the automatic extension of the Indirect task.

<STRLEN> Assigned the length of the string entered in response to the last .ASKS directive or the string tested by the last .TEST directive. The symbol is also set when a command file is invoked (<STRLEN> contains the number of variables used in the command line) and as the result of a .PARSE statement.

<SYMTYP> Assigned the numeric code for the type of symbol tested with a .TEST directive. The symbol types have the following code numbers:

String - 4
Numeric - 2
Logical - 0

<SYSTEM> Assigned an octal number to represent the operating system on which Indirect is running. The value 1 is for an RSX-11M system; the value 6 is for an RSX-11M-PLUS system.

<SYUNIT> Assigned the unit number of the user's default device (SY:).

<TICLPP> Assigned the current page length setting for the terminal. Indirect attempts to determine the length when you first invoke it. If the information is not available, <TICLPP> defaults to 24(10).

<TICWID> Assigned the current page width setting for the terminal. Indirect attempts to determine the width when you first invoke it. If the information is not available, <TICWID> defaults to 80(10).

<TISPED> Assigned the baud rate for transmitting characters from the host system to the terminal. Indirect attempts to determine the baud rate when you first invoke it. This information is useful for determining the quality and quantity of information to be transmitted. The following list gives the octal value that corresponds to the baud rates:

1	0	13	1200
2	50	14	1800
3	75	15	2000
4	100	16	2400
5	110	17	3600
6	134	20	4800
7	150	21	7200
10	200	22	9600
11	300	23	EXTA
12	600	24	EXTB

<TITYPE> Assigned the terminal type of the terminal from which Indirect is running. Indirect attempts to determine the terminal type when you first invoke it. If the attempt fails, <TITYPE> is set to zero (0). See the RSX-11M/M-PLUS I/O Drivers Reference Manual for a list of the values that correspond to the terminal types.

4.4.1.3 Special String Symbols - The special string symbols are assigned the following string values.

Symbol	Value
<ACCOUN>	(RSX-11M-PLUS systems only.) Assigned certain accounting information from a user's accounting block (UAB). If Resource Accounting is not running on the system, the fields of <ACCOUN> are null. The information is in the following format (note the trailing comma):

```
username,sessionID,accountnumber,CPU,DIR,QIO,TAS,activetasks,
```

username	The first 14(10) characters of the user name (as it appears in the system account file) followed by the first initial.
sessionID	The 3-letter session-ID code followed by the unique login number.
accountnumber	The user's account number as it appears in the system account file.
CPU	The number of CPU ticks used since login.

DIR	The number of system directives issued since login.
QIO	The number of QIO directives issued since login.
TAS	The number of tasks run since login.
activetasks	The current number of the user's active tasks.

The individual fields can be isolated with the .PARSE directive:

```
.PARSE <ACCOUN> "," NAME SID ACNT CPU DIR QIO TAS ACT JUNK
```

Note that since double precision arithmetic is not available in Indirect, the numeric <ACCOUN> parameters cannot be converted to numeric form and manipulated in arithmetic expressions.

<CLI> Assigned the acronym (3 through 6 letters) of the current command line interpreter (for example, DCL or MCR).

<CONFIG> Contains the parameter defaults specified when the current Indirect task was built. See the module INDCFG in the system procedure library LB:[1,2]INDSYS.CLB for more details.

<DATE> Assigned the current date; format is dd-mmm-yy.

<EXSTRI> When Indirect is first initiated, contains build-time information about the Indirect task. The information includes the version number of the task and the time the task was built. Afterwards, contains the string results from a more deeply nested indirect command file. The results are sent to the calling command file.

<FILATR> Assigned the seven words of file attribute information contained in the FCS-11 File Descriptor Block (FDB). The information is from the FDB used in the last .OPENx operation. See the IAS/RSX-11 I/O Operations Reference Manual for a description of file attributes and the values of each field.

<FILSPC> Assigned the fully qualified specification for the file referred to with the last .OPEN, .OPENA, .OPENR, or .TESTFILE directive operation, or in the last specification for a nested command file.

<FMASK> Contains octal values representing answers to some of the system generation questions. Refer to the module INDSFN in the system procedure library LB:[1,2]INDSYS.CLB for an explanation of the values.

<LIBUIC> (RSX-11M-PLUS systems only.) Assigned the UIC of the current nonprivileged task library; format is [ggg,mmm]. This symbol is valid on RSX-11M systems but has no logical meaning. If used, it is set by default to the system UIC.

<LOGDEV> Assigned the device name and unit number of the user's login account on multiuser protection systems. On other systems, <LOGDEV> is assigned SY0: (the system device).

<LOGUIC> Assigned the login UIC of the current user on multiuser protection systems; format is [ggg,mmm]. On other systems, <LOGUIC> is assigned the current default UIC.

<NETUIC> Assigned the UIC in which DECnet-related tasks are stored on the system volume; format is [ggg,mmm]. <NETUIC> is used with <SYSUIC> and <LIBUIC> to separate the components of the system.

<NETNOD> Assigned the DECnet node name of the system. If the system is not on the DECnet system, <NETNOD> is assigned RSX11.

<NXTSYM> Used as part of a dump routine in the command library file LB:[1,2]INDSYS.CLB. This is a DIGITAL-supplied symbol and it is highly recommended that you not use it.

<SYSDEV> Assigned the physical name for the boot device for the system. The device name is in the form ddn.

<SYDISK> Assigned the device mnemonic (two letters) of the user's default device (SY:); format is dd.

<SYSID> Assigned the operating system's baselevel number.

<SYSUIC> Assigned the system UIC; format is [ggg,mmm].

<TIME> Assigned the current time; format is hh:mm:ss.

<UIC> Assigned the current UIC; format is [ggg,mmm].

4.4.2 Numeric Symbols and Expressions

A numeric symbol is a string of digits representing a value in the range of 0 through 177777(8) (0 through 65535 decimal if immediately followed by a period or if decimal mode has been enabled). If an arithmetic operation yields a result outside of this range, a fatal error occurs and the message

```
. AT. -- NUMERIC UNDER- OR OVERFLOW
```

is displayed.

A numeric symbol or constant may be combined with another numeric symbol or constant by a logical or arithmetic operator to form a numeric expression. Arithmetic operators are used to add (+), subtract (-), multiply (*), and divide (/). Logical operators are the inclusive OR (!), logical AND (&), and NOT (#). No embedded blanks or tabs are permitted between operators.

Numeric expressions are evaluated from left to right unless parentheses are used to form subexpressions that are evaluated first. For example, the directive lines:

```
.SETN N1 2
.SETN N2 3
.SETN N3 N1+N2*4
```

assign numeric symbol N3 the value 24(8) whereas the directive lines

```
.SETN N1 2
.SETN N2 3
.SETN N3 N1+(N2*4)
```

assign numeric symbol N3 the value 16(8).

Numeric expressions are permitted as second operands in numeric .IF and .SETN directives. They are also permitted as range and default arguments in .ASKN and .ASKS directives. The directives .EXIT and .STOP permit numeric expressions to represent exit status.

With each numeric symbol, Indirect associates a radix -- either octal or decimal. The radix of a numeric symbol changes each time the symbol is assigned a new value. If you use a numeric expression to assign a new value to a symbol and all operands in the expression are octal, then the symbol is set to octal. If any operand in the expression is decimal, the symbol is set to decimal. For example:

```
.SETN N1 2                  ! N1 is octal
.SETN N2 3.                 ! N2 is decimal
.SETN N3 N1+3               ! N3 is octal
.SETN N3 N1+3.              ! N3 is decimal
.SETN N3 N1+N2              ! N3 is decimal
```

You can also assign a new value to a symbol with the .ASKN directive. See Section 4.6.3 for more information.

The .SETO and .SETD directives allow you to change the radix of a numeric symbol without changing the value of the symbol. For example:

```
.SETN N1 10.                ! N1 = 10 decimal
.SETO N1                    ! N1 = 12 octal
```

See Section 4.6.31 for more information on .SETO and .SETD.

The radix of a numeric symbol does not affect arithmetic operations or comparisons. The radix is important only when substituting a numeric symbol into a string. If the radix of the symbol is octal, the value of the symbol is substituted into the string as an octal number. If the radix is decimal, the value is substituted as a decimal number. For example:

```
.SETN N1 10.                ! N1 = 10 decimal
; N1 = 'N1'                 ! Displayed as ; N1 = 10
.SETO N1                    ! Make N1 octal
; N1 = 'N1'                 ! Displayed as ; N1 = 12
```

If you substitute a numeric symbol into a string and the substituted number is decimal, a period (.) following the symbol name causes a trailing period to be included in the string (following the substituted number). For example:

```
.SETN N1 10.                    ! N1 = 10 decimal
; N1 = 'N1.'                    ! Displayed as ; N1 = 10.
.SETO N1                        ! Make N1 octal
; N1 = 'N1.'                    ! Displayed as ; N1 = 12
```

You can also force a numeric symbol to be substituted as an octal or decimal number by using a substitution format control string. For example:

```
.SETN N1 10.                    ! N1 = 10 decimal
; N1 = 'N1%D'                   ! Displayed as ; N1 = 10
; N1 = 'N1%O'                   ! Displayed as ; N1 = 12
```

See Section 4.4.5.1 for more information on substitution format control strings.

4.4.3 String Symbols, Substrings, and Expressions

A string constant is a string of any printable characters enclosed by quotation marks. Empty strings are also permitted. The number of characters cannot exceed 132(10). For example:

```
"ABCDEF"
  ""
```

String symbols may have the value of any string constant. The value is assigned by a .SETS or .ASKS directive. For example, the directive statements

```
.SETS   S1   "ABCDEF"
.SETS   S2    S1
```

assign string symbol S2 the value of string symbol S1 (that is, ABCDEF).

A substring facilitates the extraction of a segment from the value of a string symbol. You can use substrings only in second operands of .SETS and .IF directives. For example, the directive statements

```
.SETS   S1   "ABCDEF"
.SETS   S2    S1[1:3]
```

assign string symbol S2 the value of string symbol S1 beginning at character one and ending at character three (that is, ABC).

You can also use the syntax [n:*] to extract the characters from position n to the end of the string. For example, the directive statements

```
.SETS  S1  "ABCDEF"
.SETS  S2  S1[3:*]
```

assign string symbol S2 the value CDEF.

You can combine a string constant, symbol, or substring with another string constant, symbol, or substring by the string concatenation operator (+) to form a string expression.

String expressions are permitted as second operands in .SETS and .IF directives where the first operand is a string symbol. For example, the directive statements

```
.SETS   S1   "A"
.SETS   S2   "CDEF"
.SETS   S3   S1+"B"+S2[1:3]
```

assign string symbol S3 the value of the concatenation of string symbol S1, string constant "B", and the first three characters of string symbol S2 (that is, ABCDE).

4.4.4 Reserved Symbols

Parameters for a command file can be passed to Indirect for processing. The parameters are stored in the following reserved local symbols:

P0, P1, P2, P3, P4, P5, P6, P7, P8, P9, COMMAN

The symbol COMMAN contains everything in the issuing command line, including the specification for the command file. The symbols P0 through P9 contain individual elements of the command line. The elements are delimited by spaces.

With the .GOSUB directive (see Section 4.6.16), any parameters to the right of the label and to the left of a comment are transferred to the symbol COMMAN. The value of COMMAN can then be parsed to obtain formal call parameters.

4.4.5 Symbol Value Substitution

Substitution can occur in any command line. Indirect can use the values assigned to logical, numeric, string, or special symbols by replacing a normal parameter (for example, a device unit) with the symbol name enclosed in apostrophes (for example, 'DEV'). When a previous directive has enabled substitution mode (.ENABLE SUBSTITUTION), Indirect replaces the symbol name enclosed in apostrophes with the value assigned to the symbol.

When Indirect encounters an apostrophe, it treats the subsequent text, up to a second apostrophe, as a symbol name. Indirect then searches the table of symbols for the corresponding symbol and substitutes the value of the symbol in place of the symbol name and surrounding apostrophes in the command line.

For example, the first three lines in the following example appear in an indirect command file. When the processor executes these lines, it displays the last two lines at the entering terminal.

```
.ASKS DEV MOUNT ON DEVICE?
.ENABLE SUBSTITUTION
MOUNT 'DEV'

>* MOUNT ON DEVICE?  [S]: DK2:
>MOUNT DK2:
```

DK2: was entered in response to the displayed question. This reply assigned the string value DK2: to string symbol DEV. Then when Indirect read:

```
MOUNT 'DEV'
```

it substituted for 'DEV' the value assigned to DEV (that is, DK2:). If substitution mode was not enabled, Indirect would simply have passed the line to the CLI as it appeared in the command file (that is, MOUNT 'DEV').

If substitution mode is enabled, an apostrophe signals the beginning of a string symbol. Thus, to include a single quote as text within a command line, rather than as the start of a symbol, you must replace the single quote with two contiguous apostrophes ('').

If substitution mode is enabled, Indirect displays the command file line

```
! DON''T SHOOT
```

as

```
! DON'T SHOOT
```

4.4.5.1 **Substitution Format Control** - The conversion of numeric values to strings and the placement of string and logical values in a substitution operation can be controlled with a format control string. The control string is in the following form:

```
...'symbol%controlstring'...
```

The control string begins with the percent sign (%) and ends with the second of the two apostrophes that denote the substitution operation. The control string consists of one or more of the following characters:

C	Compress leading, embedded, and trailing blanks, and remove embedded nulls.
D	Force the conversion of a numeric symbol to decimal.
O	Force the conversion of a numeric symbol to octal.
S	Perform signed conversion for a numeric symbol.
M	Perform magnitude conversion for a numeric symbol.
Z	Return leading zeros for a positive numeric value.
Rn	Right-justify the resulting string, truncating to 'n' decimal characters if necessary.
Ln	Left-justify the resulting string, truncating to 'n' decimal characters if necessary.
X	Convert the variable to Radix-50 characters.
V	If the symbol being substituted is numeric, convert the low byte to its equivalent ASCII character and substitute it.

If the symbol being substituted is a string, convert the first character to its octal representation and substitute it.

Indirect does not perform a consistency check on the control string. If you specify conflicting format characters, Indirect uses the last one specified.

4.5 SWITCHES

The indirect command processor accepts six switches: /TR, /DE, /MC, /CLI, /LB, and /LO.

Switch	Function
/[NO]TR	Displays a trace of the indirect command file on the entering terminal. This function is useful for debugging an indirect command file. Each command line, including Indirect directive statements, is displayed. As each Indirect command line is processed, a number representing the nesting depth of the command file is displayed, followed by an exclamation mark and the command line. If the command line causes some action to occur, the next printed line indicates the action; usually, this line consists of the CLI commands issued as a result of the previous directive. The default is /NOTR.
/[NO]DE	Indicates that the indirect command file is to be deleted when its processing is complete unless a logical end-of-file (/) or .STOP directive is encountered before the end of the file. The default is /NODE.
/[NO]MC	Passes commands not processed by Indirect to the default command line interpreter (CLI) for your terminal. This switch is synonymous with /[NO]CLI. The default is /MC.
/[NO]CLI	Passes commands not processed by Indirect to the default command line interpreter (CLI) for your terminal. This switch is synonymous with /[NO]MC. The default is /CLI.
/LB	Indicates that the specified file is a universal library of command procedures and that the specified module is the procedure to be executed. When command procedures, which are indirect command files, are inserted into a universal library with the Librarian Utility Program (see the RSX-11M/M-PLUS Utilities Manual), you can then reference them with /LB:module. Command libraries are built by creating a universal library and inserting command files into it. You can then reference the procedures in the library with the following command line: @command-library/LB:module

The default file type for a command library is .CLB.

If you do not specify a module (@command-library/LB), Indirect attempts to locate a module called .MAIN..

If you do not specify a library name (@/LB:module), the following actions occur:

- If the command is issued from the terminal or from a file that is not in the library, Indirect ignores the /LB switch and treats the command line as though you had used @module.CMD. Note that if the command is issued from a command file, the default device and directory of the specified module are the same as those for the current file, not necessarily the same as those for the terminal.

- If the command was issued from within a library, the specified module is searched for in the current library.

These default actions for an unspecified library allow a collection of procedures to be developed in a given directory with the @/LB:module or .CHAIN /LB:module commands. When the procedures are then placed in a library, no source changes are required.

Example:

The command file PARAM.CMD contains parameter definitions for the .SETN directive and the command file SYSPRC.CMD contains system-specific procedures. Use the following command lines to create the command library and enter the command files into it:

```
LBR>SYSTART.CLB/CR::::UNI:CMD
LBR>SYSTART.CLB=PARAM/IN:PARAM
LBR>SYSTART.CLB=SYSPRC/IN:PROCED
```

You can then use the following command lines to reference the command library modules:

```
@SYSTART/LB:PARAM      !Define global symbols
@SYSTART/LB:PROCED     !Run init procedure
```

DIGITAL supplies a library of command procedures. The library is LB:[1,2]INDSYS.CLB and it contains the following procedures:

INDCFG	Displays the current build parameters for the running Indirect task.
INDDMP	Dumps to the terminal the contents of the Indirect symbol table.
INDPRF	A sample procedure to fully parse file-name strings.
INDSFN	Returns system configuration information.

INDVFY Displays the values of all of the special symbols.

QIOERR Returns a string expansion of the <FILERR> error codes.

FMSDEM (RSX-11M-PLUS systems only.) Demonstrates the FMS-11/RSX V1.0 interface incorporated into Indirect. Associated with this procedure is FMSERR, which defines the FMS error codes and parameters.

.INDEX Displays an index of the procedures in the library.

The following command line shows the format for invoking a command procedure in the library:

```
@LB:[1,2]INDSYS/LB:procedurename
```

Before you attempt to access a command procedure, make sure that INDSYS.CLB is in LB:[1,2]. If it is not in this directory, your system manager must copy the library off of the source kit for the system. (On RSX-11M, the library is included with the source files for MCR, which are in UFD [12,10].)

/[NO]LO Indicates that when a new command file is executing, it can have access to the local symbols created by its calling command file, and that any local symbols created by the new command file will be defined as local symbols for the calling command file. The default is /NOLO.

Use any combination of the switches in the command line

```
@filename/switches
```

or directive statement

```
.CHAIN filename/switches
```

The switches you specify in the terminal command line that initiates Indirect processing are used as defaults when executing the following commands: @filename[/switches] or .CHAIN filename[/switches]. This does not apply, however, for the /DE switch; the default is always /NODE.

4.6 DESCRIPTION OF INDIRECT DIRECTIVES

Directives must be separated from their arguments and from CLI-specific commands by at least one space. Only one directive per command line is allowed.

You can insert any number of blanks and horizontal tabs in three places of a command line:

- At the start of the command line
- Immediately following the colon (:) of a label
- At the end of the command line

This allows you to format the command files for readability. The recommended procedure is to begin labels in column one and everything else in column nine (after one horizontal tab).

An important exception is the lines processed between .ENABLE and .DISABLE DATA directives; no blanks or tabs are removed from these lines. For example:

```
        .IFT Z .GOTO 10
        MAC @ASM
.10:    TKB @BLD
        .OPEN DATFIL
        .DATA XXXXX
.ENABLE DATA
This is data
that goes into
the data file.
.DISABLE DATA
        .GOTO 20
```

Note that the .DISABLE DATA statement must begin in column 1 or Indirect will place it in the data file. You can also use the .CLOSE directive in place of .DISABLE DATA. It too must begin in column 1.

4.6.1 Define a Label .label:

Labels always appear at the beginning of the line; they may be on a line with additional directives and/or a CLI command, on a line with a comment, or on a line by themselves. When control passes to a line with a label, the line is processed from the first character after the colon.

Commands do not have to be separated from the label by a space. Only one label is permitted per line. Labels are one through six characters in length and must be preceded by a period and terminated by a colon. A label may contain only alphanumeric characters and/or dollar signs ($).

It is also possible to define a label as a direct access label; once the label is found, its position in the command file is saved. This allows subsequent jumps to frequently called labels or subroutines to be effected quickly. The first statement processed after a jump to a direct access label is the one on the next line. The maximum number of direct access labels you can define within an indirect command file depends on the version of the Indirect task you are using. (The maximum number is specified in the task build file.) If you define more than the maximum number allowed, the subsequent direct access labels replace the earliest and so on. The smaller the number of direct access labels, the larger the amount of free symbol table space.

To declare a label for direct access, leave the line following the colon blank.

Examples:

```
.100:   .ASK A DO YOU WANT TO CONTINUE?

        .IFT A .GOSUB 200
          .
          .
          .

.200:

        .;THIS IS THE START OF A SUBROUTINE
          .
          .
          .
        .RETURN
```

4.6.2 Ask a Question and Wait for a Reply .ASK

The .ASK directive prints a question on the terminal, waits for a reply, and sets a specified logical symbol to the value of true or false, depending on the reply. If the symbol has not already been defined, Indirect makes an entry in the symbol table. If the symbol has been defined, Indirect resets its value (true or false) in accordance with the reply. Indirect exits with a fatal error if the symbol was previously defined as a string or numeric symbol.

Formats (brackets are required syntax):

```
.ASK ssssss txt-strng
.ASK [default:timeout] ssssss txt-strng
.ASK [:timeout] ssssss txt-strng
```

where:

ssssss	The 1- to 6-character symbol to be assigned a true or false value.
txt-strng	The question or prompt that Indirect displays.
default	The default response; used if the question is answered with an empty line (null) or if timeout occurs. The default can be <TRUE> or <FALSE> or another logical variable.
timeout	The timeout count. Indirect waits this long for a response, then applies the default answer. The format for timeout is nnu, where nn is the decimal number of time units to wait and u is T (ticks), S (seconds), M (minutes), or H (hours). The timeout count is valid only if timeout mode is enabled (.ENABLE TIMEOUT).

The entire .ASK statement must fit on one command line.

Note that if you omit the default value but specify a timeout count, the colon is required for positional identification.

When executing an .ASK directive, Indirect displays txt-strng prefixed by an asterisk and suffixed with "? [Y/N]:". Indirect recognizes five answers:

1. Y RET — Set symbol ssssss to true.
2. N RET — Set symbol ssssss to false.
3. RET — Set symbol to false or to user-specified default value. RET indicates the RETURN key.
4. ESC — Set symbol ssssss to true and set the special logical symbol <ESCAPE> to true only if escape recognition has been enabled. ESC indicates the ESCAPE or ALTMODE key.
5. CTRL Z — If Control ' mode is enabled, set <EOF> to true and proceed, else exit immediately.

Example:

The directive statement

```
.ASK INSPIP DO YOU WANT TO INSTALL PIP
```

displays

```
>* DO YOU WANT TO INSTALL PIP? [Y/N]:
```

on the terminal. Symbol INSPIP will be set to t ue or false after you type Y, N, the RETURN key, or the ESCAPE key (if escape recognition is enabled).

4.6.3 Ask for Definition of a Numeric Symbol .ASKN

The .ASKN directive prints on the terminal a request for a numeric value, waits for it to be entered, optionally tests the range for the numeric response and/or applies a default value, and sets the specified symbol accordingly. If the symbol has not previously been defined, Indirect makes an entry in the symbol table. If the symbol has already been defined, Indirect resets its value in accordance with the reply. Indirect exits with a fatal error if the symb' was previously defined as a logical or string symbol.

Formats (brackets are required syntax):

```
.ASKN ssssss txt-strng
.ASKN [low:high:default:timeout] ssssss txt-strng
```

where:

- ssssss — The 1- to 6-character symbol to be assigned a numeric value.
- txt-strng — The question or prompt that Indirect displays.
- low:high — A numeric expression giving the range for the response.
- default — A numeric expression or symbol giving the default value.

timeout — The timeout count. Indirect waits this long for a response, then applies the default answer. The format for timeout is nnu, where nn is the decimal number of time units to wait and u is T (ticks), S (seconds), M (minutes), or H (hours). The timeout count is valid only if timeout mode is enabled (.ENABLE TIMEOUT).

The entire .ASKN statement must fit on one command line.

Note that if you omit any of the parameters within the square brackets, any preceding colons are required for positional identification.

The command line cannot exceed 132(10) characters in length. When executing an .ASKN directive, Indirect displays txt-strng prefixed by an asterisk and suffixed with [O]: to indicate that the response is considered as octal or [D]: to indicate that the response is considered as decimal. The reply must be a number either within the specified range or in the range 0 through 177777(8) (by default) or 0 through 65535(10).

If the response is outside the specified range, the message

```
AT. -- VALUE NOT IN RANGE
```

is displayed and the query repeated.

If an arithmetic operation yields a result greater than 177777(8) when computing the actual value of any of the arguments (low, high, or default), a fatal error occurs and the message

```
AT. -- NUMERIC UNDER- OR OVERFLOW
```

is displayed.

If the response is an empty line (null) and a default value (default) was not specified, Indirect applies a default of 0. Note that in this case, the range, if specified, must include 0.

The response may be either octal or decimal; a leading pound sign (#) forces octal, a trailing period (.) forces decimal. In the absence of both, Indirect applies a default radix. The default radix is decimal if either the range or default values are decimal expressions (followed by a period). Otherwise, the default radix is octal (unless decimal mode has been enabled). Indirect displays the default type as either [O] or [D].

To force a default decimal radix without specifying a range argument, use the following construction:

```
.ASKN [::0.] A ENTER VALUE
```

or

```
.ENABLE DECIMAL
.ASKN A ENTER VALUE
```

Examples:

- The directive statement

  ```
  .ASKN  SYM  DEFINE NUMERIC SYMBOL A
  ```

  displays

  ```
  >*DEFINE NUMERIC SYMBOL A [O]:
  ```

  on the terminal where:

  [O] is the default radix (octal).

  Indirect then defines symbol SYM according to the reply entered.

- The directive statement

  ```
  .ASKN [2:35:16:20S] NUMSYM DEFINE NUMERIC SYMBOL A
  ```

  displays

  ```
  >* DEFINE NUMERIC SYMBOL A [O R:2-35 D:16 T:20S]:
  ```

  in the format [x R:low-high D:default T:timeout]

  where:

x	O if the default radix is octal or D if it is decimal.
R:low-high	The specified range.
D:default	The specified default.
T:timeout	The specified timeout count before the default answer is applied.

  Indirect then checks that the response string is in the specified range.

- The directive statement

  ```
  .ASKN [NUMSYM+10:45:NUMSYM+10] SYM DEFINE NUMERIC SYMBOL B
  ```

  displays (assuming the value of 16 octal for NUMSYM)

  ```
  >* DEFINE NUMERIC SYMBOL B [O R:26-45 D:26]:
  ```

4.6.4 Ask for Definition of a String Symbol .ASKS

The .ASKS directive prints on the terminal a request for a string value to define a specified symbol and optionally tests that the number of characters in the response string falls within the specified range. If the symbol has not previously been defined, Indirect makes an entry in the symbol table. If the symbol has already been defined, Indirect resets its value in accordance with the reply. Indirect exits with a fatal error if the symbol was defined previously as a

logical or numeric symbol. If the number of characters is out of the specified range, the message

```
AT. -- STRING LENGTH NOT IN RANGE
```

is displayed and the question repeated.

Formats (brackets are required syntax):

```
.ASKS ssssss txt-strng
.ASKS [low:high:default:timeout] ssssss txt-strng
```

where:

ssssss	The 1- to 6-character symbol to be assigned a string value.
txt-strng	The question or prompt that Indirect displays.
low:high	A numeric expression giving the range for the number of characters permitted in the response string.
default	A string expression or symbol giving the default value.
timeout	The timeout count. Indirect waits this long for a response, then applies the default answer. The format for timeout is nnu, where nn is the decimal number of time units to wait and u is T (ticks), S (seconds), M (minutes), or H (hours). The timeout count is valid only if timeout mode is enabled (.ENABLE TIMEOUT).

The entire .ASKS statement must fit on one command line.

Note that if you omit any of the parameters within the square brackets, any preceding colons are required for positional identification.

When executing an .ASKS directive, Indirect displays txt-strng prefixed by an asterisk (*) and suffixes it with [S]:. The reply must be an ASCII character string.

Examples:

- The directive statement

  ```
  .ASKS NAM PLEASE ENTER YOUR NAME
  ```

  displays

  ```
  >* PLEASE ENTER YOUR NAME [S]:
  ```

  on the terminal. Indirect then defines symbol NAM according to the string reply entered.

- The directive statement

  .ASKS [1:15::10S] MIDNAM PLEASE ENTER YOUR MIDDLE NAME

  displays

  >* PLEASE ENTER YOUR MIDDLE NAME [S R:1-15 T:10S]:

  in the format [S R:low-high T:timeout]

  where:

S	The symbol type (string).
R:low-high	The specified range for number of characters.
T:timeout	The specified timeout count.

4.6.5 Begin Block .BEGIN

The .BEGIN directive marks the beginning of a Begin-End block. The block must be terminated with an .END directive.

Labels and local symbols defined following the .BEGIN directive are local to the block instead of being used throughout the entire command file. Therefore, labels and local symbols defined inside a block lose definition outside the block. (Labels and symbols defined outside a block retain definition throughout the file.) Labels and symbols defined outside a block and then modified within the block, however, assume and retain the value assigned in the block.

Labels and local symbols defined within a block lose definition with an .ERASE LOCAL directive statement (see Section 4.6.14) or with the .END directive

.BEGIN must be the only directive on a command line. For example, the .BEGIN directive cannot appear on the same line as an .IF directive.

Format:

```
.BEGIN
```

as the only directive on the line.

4.6.6 Continue Processing Using Another File .CHAIN

The .CHAIN directive closes the current file, erases all local symbols, clears any .ONERR arguments, empties the direct access label cache, and continues processing using command lines from another file. However, the .CHAIN directive does not close data files or change the nested-file level.

Format (brackets not part of syntax):

```
.CHAIN filename[/switches]
```

where filename is the name of the file that contains the new command lines and /switches are any of the optional switches described in Section 4.5.

Example:

The directive statement

```
.CHAIN OUTPUT
```

transfers control to the file OUTPUT.CMD.

4.6.7 Close Secondary File .CLOSE

The .CLOSE directive closes the secondary file opened by an .OPEN directive.

Format (brackets not part of syntax):

```
.CLOSE [#n]
```

where:

#n An optional file number in the range 0 to x-1, where x is the number of file-open FDBs specified in the build file for the Indirect task. (x is the maximum number of files that can be open simultaneously.) The default is #0. You can substitute a numeric symbol for the value n by enclosing the symbol in apostrophes.

4.6.8 Output Data to Secondary File .DATA

The .DATA directive specifies text that is to be output to a secondary file previously opened by an .OPEN directive.

When Indirect processes the text string that follows the .DATA directive, it ignores the leading space (if present), assuming it to be a separator between the directive and the text string. Any other spaces are transferred to the data file. If a TAB follows the directive, it is transferred to the file. If no other characters follow the directive, a blank line is transferred to the file. This processing has the following results:

Command File	Open File
.DATA foo⏎	foo⏎
.DATA foo⏎	foo⏎
.DATA ⇥ foo⏎	⇥ foo⏎
.DATA ⇥ foo⏎	⇥ foo⏎
.DATA⏎	null line

Note that if a comment follows a .DATA statement (that is, .DATA data !comment), Indirect also outputs the comment to the secondary file because it cannot tell if the comment pertains to the .DATA statement itself or to the data being output to the file.

Format (brackets not part of syntax):

```
.DATA [#n] txt-strng
```

where:

txt-strng — The text to be output to the secondary file.

#n — An optional file number in the range 0 to x-1, where x is the number of file-open FDBs specified in the build file for the Indirect task. (x is the maximum number of files that can be open simultaneously.) The default is #0. You can substitute a numeric symbol for the value x by enclosing the symbol in apostrophes.

The command line cannot exceed 132(10) characters and the specified text string cannot continue onto the next line. If a secondary file is not open, an error condition exists; Indirect issues an error message and begins error processing.

Example:

```
.SETS SEND "THIS IS DATA"
.OPEN TEMP
.I    'SEND'
.CLOSE
```

These directives output THIS IS DATA to the secondary file TEMP.DAT (.DAT is the default file type for a data file).

4.6.9 Decrement Numeric Symbol .DEC

The .DEC directive decrements a numeric symbol by one. Indirect exits with a fatal error if the symbol was defined previously as a logical or string symbol.

Format:

```
.DEC ssssss
```

where:

ssssss — The 1- to 6-character numeric symbol.

Example:

```
.DEC X
```

This directive decrements by 1 the value assigned to the numeric symbol X.

4.6.10 Delay Execution for a Specified Period of Time .DELAY

The .DELAY directive delays further processing of the file for a specified period of time.

Format:

```
.DELAY nnu
```

where:

nn	The decimal number of time units to delay.
u	T - ticks S - seconds M - minutes H - hours

The parameter nn is decimal by default, or octal if preceded by a pound sign (#). For example:

```
10S is 10(10) seconds

#10S is 10(8) seconds
```

If quiet mode is disabled when the .DELAY directive is executed, Indirect issues the message

```
AT. -- DELAYING
```

When the time period expires and the task resumes, Indirect issues the message

```
AT. -- CONTINUING
```

Example:

The directive statement

```
.DELAY 20M
```

delays processing for 20(10) minutes.

4.6.11 Disable Option .DISABLE

The .DISABLE directive disables a specified operating mode previously activated by an .ENABLE directive. See Section 4.6.12 for operating mode information.

Format:

```
.DISABLE option[,option...]
```

The following is a list of the operating modes that can be disabled:

ATTACH	DETACH	GLOBAL	TIMEOUT
CONTROL-Z	DISPLAY	LOWERCASE	TRACE
DATA	ESCAPE	MCR	TRUNCATE
DECIMAL	ESCAPE-SEQ	OVERFLOW	SUBSTITUTION
DELETE		QUIET	

Note that when you disable detach mode from a command file and then request a task or CLI command to display information, the command file may not be able to continue executing. The task or CLI command may need to attach to the terminal to display the information but will not be able to do so because Indirect cannot detach from the terminal.

4.6.12 Enable Option .ENABLE

The .ENABLE directive is used to invoke several operating modes. Each mode is independent of the others; all of them can be active simultaneously. When Indirect starts to process a file, the initial settings are:

ATTACH	enabled	GLOBAL	enabled
CONTROL-Z	disabled	LOWERCASE	enabled
DATA	disabled	MCR	enabled
DECIMAL	disabled	OVERFLOW	disabled
DELETE	disabled	QUIET	disabled
DETACH	enabled	SUBSTITUTION	disabled
DISPLAY	enabled	TIMEOUT	enabled
ESCAPE	disabled	TRACE	disabled
ESCAPE-SEQ	disabled	TRUNCATE	disabled

In attach mode, Indirect attaches to a terminal when displaying comment lines. In detach mode, it detaches from the terminal when processing command lines. Enabling both of these modes allows you to type CTRL/O to suppress a lengthy comment.

Enabling Control-Z mode allows a command file to detect a CTRL/Z response to a question and continue processing. If Control-Z mode is disabled and you type CTRL/Z in response to an .ASKx question, Indirect exits. If Control-Z mode is enabled, the special symbol <EOF> is set to true and Indirect continues processing the command file.

In data mode, Indirect outputs lines that follow an .ENABLE DATA directive statement to a secondary file. (The .DATA directive sends a single line of text to a secondary file; see Section 4.6.8.) To disable data mode, the .DISABLE DATA (or .CLOSE) statement must begin in the first column. Otherwise, Indirect copies the statement itself into the data file. The .ENABLE DATA directive also has an optional argument (#n) that specifies which file the data is to go into. See the description of the .DATA directive (Section 4.6.8) for more information.

In global symbol mode, symbol names that begin with a dollar sign ($) are defined as global to all levels of indirect files; once such a symbol has been defined, all levels recognize it. Symbols that do not begin with a dollar sign are recognized only within the level that defines them.

In decimal mode, all numeric symbols are created or redefined by default as decimal instead of as octal.

In delete mode, the current command file is deleted when Indirect processes the last command line in the file.

In display mode, Indirect displays the current fields for the .ASKx directives and @ <EOF>. If display mode is disabled, Indirect displays only the text string for the .ASKx directive and suppresses @ <EOF>.

In MCR mode, commands not processed by Indirect are passed to the default CLI of the terminal. The CLI might be MCR, DCL, or a user-written CLI. MCR mode is equivalent to the functions of the /CLI and /MC switches.

In lowercase mode, characters read from the terminal in response to .ASKS directives are stored in the string symbol without lower- to uppercase conversion. The representation of characters is significant when comparing strings (see Section 4.6.18) since the .IF directive distinguishes between lowercase and uppercase characters.

In substitution mode, Indirect substitutes a string for a symbol. The symbol must begin and end in apostrophes ('symbol'). For example, if the symbol A has been assigned the string value THIS IS A TEST, then every 'A' will be replaced by THIS IS A TEST. When substitution mode is enabled, Indirect performs substitutions in each line before scanning the line for directives and CLI commands. (While obeying a .GOTO label directive, however, Indirect ignores any undefined symbols encountered before the target line, that is, the line containing the specified label.)

Escape recognition (.ENABLE ESCAPE) permits the response to an .ASK, .ASKN, or .ASKS directive to be an escape character. A question answered with a single escape character sets the special logical symbol <ESCAPE> to true. The escape character must be used only as an immediate terminator to the question; if one or more characters precede the escape character, an error condition exists. In this case, the message

```
AT. -- INVALID ANSWER OR TERMINATOR
```

is printed and the question repeated. Note that if you press the ESCAPE key in response to an .ASK directive, the specified logical symbol (ssssss of .ASK ssssss txt-strng) is also set to true.

Escape-sequence recognition (.ENABLE ESCAPE-SEQ) forces Indirect to attach to the terminal for escape-sequence recognition, using the IO.ATT!TF.SEQ I/O function. In this mode, the result of an .ASKx or .READ statement from the terminal will contain the terminating escape character and escape sequence as documented in the full-duplex terminal driver chapter of the RSX-11M/M-PLUS I/O Drivers Reference Manual.

Overflow mode allows signed arithmetic in numeric expressions. Enabling the mode provides for numeric expressions and operations that otherwise would result in the "Numeric under- or overflow" error message.

Quiet mode is valid only in systems that support parent-offspring tasking; the directive performs no function in systems that do not support parent-offspring tasking. In quiet mode, the processor does not echo CLI command lines or comments. The command lines are executed normally and, if they return a message or display, the message or display is printed on the terminal.

In timeout mode, Indirect uses the timeout parameters specified with the .ASKx directives. Indirect waits for the timeout count to elapse and then applies the default answer to the directives. Timeout mode must be enabled (the default) to use the timeout counts for the .ASKx directives.

In trace mode, command lines that Indirect has processed are displayed on the terminal. As each line is processed, it is displayed with its nesting level and an exclamation mark (!). Trace mode is equivalent to the function of the /TR switch.

In truncate mode, Indirect ignores any truncate errors on a .READ directive. A truncate error occurs when a line in a file is too long. If the full record cannot fit within the 132(10)-character limit of the symbol, the record is truncated.

Formats (brackets not part of syntax):

```
.ENABLE option[,option...]

.ENABLE DATA [#n]
```

where:

#n An optional file number in the range 0 to x-1, where x is the number of file-open FDBs specified in the build file for the Indirect task. (x is the maximum number of files that can be open simultaneously.) The default is #0. You can substitute a numeric symbol for the value n by enclosing the symbol in apostrophes.

Examples (assuming that MCR is the default CLI for the terminal):

- Substitution mode:

```
.ENABLE SUBSTITUTION
.ASKS FIL SPECIFY SOURCE FILE
MAC  'FIL'='FIL'
```

When the file is executing, the corresponding lines displayed at the terminal are:

```
>* SPECIFY SOURCE FILE [S]: SOURCE
>MAC SOURCE=SOURCE
```

- Global symbol mode:

The following two lines appear in an indirect command file called TEST1:

```
.ENABLE GLOBAL
.SETS $X "TEST"
```

A file called TEST2.CMD contains the following lines:

```
.ENABLE SUBSTITUTION
@TEST1
MAC '$X','$X'='$X'
```

Therefore, MCR displays the following when the file TEST2.CMD is run:

```
>MAC TEST,TEST=TEST
>@ <EOF>
```

- Escape recognition mode:

```
;IF YOU WANT A LIST OF OPTIONS, TYPE <ESC>.
.ENABLE ESCAPE
.ASKS A ENTER OPTION
.IFT <ESCAPE> .GOTO LIST
        .
        .
        .
.LIST: ;OPTIONS ARE: A (ADD), S (SUBTRACT), M (MULTIPLY)
```

If you press the ESCAPE key in response to ENTER OPTION, the lines displayed at the terminal are:

```
>;IF YOU WANT A LIST OF OPTIONS, TYPE <ESC>.
>* ENTER OPTION [S]:  ESC
>;OPTIONS ARE:  A (ADD), S (SUBTRACT), M (MULTIPLY)
```

- Quiet mode:

```
.ASK QUIET DO YOU WANT COMMAND LINES SUPPRESSED
.IFT QUIET .ENABLE QUIET
.IFF QUIET .DISABLE QUIET
ACT
```

If the response is affirmative, Indirect displays the active tasks but not the ACTIVE command. For example:

```
>DO YOU WANT COMMAND LINES SUPPRESSED?  [Y/N]: Y
MCR...
ACTT17
AT.T17
```

- Control-Z mode:

```
.ENABLE CONTROL-Z
.ASK RESP DO YOU WISH TO CONTINUE
.IFT <EOF> .GOTO CLENUP
.IFF RESP .GOTO CLENUP
```

If you type CTRL/Z in response to the question, <EOF> is set to true and Indirect transfers to CLENUP.

4.6.13 End Block .END

The .END directive marks the end of the Begin-End block. If Indirect encounters more .END directives than .BEGIN directives, command processing terminates and the following message is displayed:

```
AT.  -- ILLEGAL NESTING
```

Format:

```
.END
```

as the only directive on the line.

4.6.14 Delete Symbols .ERASE

The .ERASE directive deletes all local or global symbol definitions, or a specific global symbol definition. When you define a symbol, either locally (by defining a symbol value) or globally (by enabling global symbol mode and preceding the symbol name with a dollar sign ($)), Indirect creates an entry in the symbol table. The .ERASE directive erases either all local or all global entries, or a specific global entry, in the table.

Following an .ERASE directive, you can redefine symbol values as well as symbol type.

Formats:

```
.ERASE LOCAL
.ERASE GLOBAL
.ERASE SYMBOL global-symbol
```

An .ERASE LOCAL directive outside of a Begin-End block erases all local symbols defined within the current file.

An .ERASE LOCAL directive within a Begin-End block erases only those local symbols defined within the block.

However, note that the following actions also occur:

1. Local symbols defined within a nested file are erased when that file exits.

2. Local symbols defined within a Begin-End block are erased with .END.

3. Local symbols defined outside of Begin-End blocks are visible, modifiable, and not erasable within a Begin-End block.

An .ERASE GLOBAL, either outside of or within a Begin-End block, erases all global symbols.

An .ERASE SYMBOL global-symbol erases the specified global symbol. (Individual local symbols are not erasable.)

Example:

```
.ERASE LOCAL
```

This directive erases all local symbol definitions used in the indirect command file.

```
.ERASE SYMBOL $SWITC
```

This directive erases the single global symbol "$SWITC."

4.6.15 Exit Current Command File .EXIT

The .EXIT directive terminates processing of the current command file or Begin-End block and returns control to the previous-level command file or, if the directive is executed within a block, to the line following the .END directive. If the directive is encountered at the uppermost indirect nesting level, Indirect exits and passes control to the CLI (see the .STOP directive, Section 4.6.33).

The .EXIT directive also allows you to optionally specify a value to copy into the special symbol <EXSTAT>.

Format (brackets not part of syntax):

```
.EXIT [value]
```

where value is an optional numeric expression to be copied to the special symbol <EXSTAT>.

Examples:

The following line appears in an indirect command file called TEST1:

```
@TEST2
```

The file TEST2.CMD contains the following line:

```
.EXIT
```

When Indirect encounters the .EXIT directive in TEST2, control returns to TEST1.CMD.

If the .EXIT directive in TEST2.CMD includes a numeric expression, for example:

```
.EXIT N+2
```

Indirect evaluates the expression and copies the value into <EXSTAT>.

4.6.16 Call a Subroutine .GOSUB

The .GOSUB directive saves the current position in an indirect command file and then branches to a label. The label identifies an entry point to a subroutine that is terminated by a .RETURN directive.

When you issue a .GOSUB directive from within a Begin-End block, Indirect saves the current block context and then scans down the file searching for the first occurrence of the subroutine label. Note that during the scan, Indirect ignores any intervening .BEGIN or .END directives. The .RETURN directive restores previous block context. Thus, the subroutine can be contained within a Begin-End block.

The maximum nesting depth for subroutine calls depends on the number specified in the build file for the Indirect task.

Format:

```
.GOSUB label parameters
```

where label is the label that designates the first line of a subroutine, but without the leading period and trailing colon. Any parameters to the right of the label and to the left of a comment are transferred to the reserved local symbol COMMAN. The value of COMMAN can then be parsed with the .PARSE directive (see Section 4.6.25) to obtain formal call parameters.

Example:

The directive statement

```
.GOSUB EVAL
```

transfers control to the subroutine labeled .EVAL:.

4.6.17 Branch to a Label .GOTO

The .GOTO directive causes a branch from one line in an indirect command file to another. All commands between the .GOTO directive and the specified label are ignored. Branches can go forward or backward in the file.

The target of a .GOTO branch from within a Begin-End block must be contained in that block. The .GOTO directive cannot branch into another block. When Indirect encounters a .GOTO directive within a Begin-End block, it searches for the specified label in that block.

Since Indirect only searches the one Begin-End block, you can use the same label more than once in a command file.

Format:

.GOTO label

where label is the name of the label, but without the leading period and trailing colon.

Example:

The directive statement

.GOTO 100

transfers control to the line containing the label .100:.

4.6.18 Logical Test .IF

A number of directives make tests; if the test is true, Indirect processes the remainder of the command line. Logical tests can be combined into a compound logical test by using the .AND and .OR directives.

4.6.18.1 **Test If Symbol Meets Specified Condition (.IF) -** The .IF directive compares a numeric or string symbol with another expression of the same type to determine if one of several possible conditions is true. If the condition is satisfied, Indirect executes the remainder of the command line.

When comparing a string symbol with a string expression, Indirect compares the ASCII values of each operand's characters (from left to right) one by one. An operand is considered greater if the first nonequal character has a greater value than the corresponding character in the other operand. Numeric symbols are compared strictly on the basis of magnitude.

Format:

.IF symbol relop expr directive-statement

where:

symbol	The 1- to 6-character numeric or string symbol.
relop	One of the following relational operators: EQ or = - Equal to NE or <> - Not equal to GE or >= - Greater than or equal to LE or <= - Less than or equal to GT or > - Greater than LT or < - Less than
expr	An expression of the same type as symbol.
directive-statement	The Indirect command line to be processed if the condition is satisfied.

Examples:

```
.SETS X "A"
.SETS Y "a"
.IF X LT Y .GOTO 200
```

The ASCII value of string symbol X is less than the ASCII value of string symbol Y, which satisfies the less-than condition. Thus, control passes to the line containing the label .200:.

```
.SETN N1 2
.SETN N2 7
.IF N1 <= N2 PIP /LI
```

With the condition satisfied (numeric symbol N1 less than or equal to numeric symbol N2), the PIP command is processed.

```
.SETS S1 "AAb"
.SETS S2 "AA"
.SETS S3 "BBBB"
.IF S1 >= S2+S3[1:1] .INC N
```

Since the condition where string symbol S1 is greater than or equal to string symbol S2 concatenated with the first character of string symbol S3 (AAb >= AAB) is satisfied, Indirect increments numeric symbol N.

4.6.18.2 **Test If Task Is Active or Dormant (.IFACT/.IFNACT)** - The .IFACT or .IFNACT directive tests whether a task is active (.IFACT) or dormant (.IFNACT). If the test is true, the rest of the command is processed. If the specified task is not installed, Indirect assumes the dormant condition.

Formats:

```
.IFACT  taskname directive-statement

.IFNACT  taskname directive-statement
```

where:

taskname	A 1- to 6- character legal task name.
directive-statement	The Indirect command line to be processed if the condition is satisfied.

Examples:

```
.IFACT   REPORT  .GOTO 350

.IFNACT  REPORT  RUN REPORT
```

4.6.18.3 **Test If Symbol Is Defined or Not Defined (.IFDF/IFNDF)** - The .IFDF or .IFNDF directive tests whether a logical, numeric, or string symbol has been defined (.IFDF) or not defined (.IFNDF). If the test is true, the rest of the command line is processed. This directive does not test the value of the symbol.

Formats:

```
.IFDF  ssssss  directive-statement

.IFNDF  ssssss  directive-statement
```

where:

ssssss	The 1- to 6-character symbol being tested. The symbol can be local, global, or an Indirect special symbol.
directive-statement	The Indirect command line to be processed if the condition is satisfied.

Examples:

```
.IFDF  A  .GOTO 100

.IFNDF  A  .ASK A DO YOU WANT TO SET TIME
```

4.6.18.4 **Test If Task Is Installed Or Not Installed (.IFINS/.IFNINS)** - The .IFINS or .IFNINS directive tests whether a task is installed (.IFINS) or not installed (.IFNINS) in the system. If the test is true, the rest of the command line is processed.

Formats:

```
.IFINS  taskname  directive-statement

.IFNINS  taskname  directive-statement
```

where:

taskname	A 1- to 6-character task name.
directive-statement	The Indirect command line to be processed if the condition is satisfied.

Examples:

```
.IFINS  PIP  .GOTO 250

.IFNINS  PIP  INS $PIP
```

4.6.18.5 **Test If Mode Is Enabled Or Disabled (.IFENABLED/.IFDISABLED)** - The .IFENABLED or .IFDISABLED directive tests whether an operating mode has been enabled with the .ENABLE directive or disabled with the .DISABLE directive. (See the description of the .ENABLE directive in Section 4.6.12 for the list of operating modes.)

Formats:

```
.IFENABLED option directive-statement

.IFDISABLED option directive-statement
```

where:

option	The same operating mode option (with the exception of DATA) used with the .ENABLE or .DISABLE directive, or FULL-DUPLEX, POTASK, or FMS. (FMS is valid only on RSX-11M-PLUS systems.)
directive-statement	The Indirect command line to be processed if the condition is satisfied.

4.6.18.6 **Test If Driver Is Loaded Or Not Loaded** (.IFLOA/.IFNLOA) - The .IFLOA or .IFNLOA directive tests whether a driver is loaded (.IFLOA) or not loaded (.IFNLOA) in the system. If the test is true, the rest of the command line is processed. Note that for purposes of this directive, resident drivers are assumed to be loaded.

Formats:

```
.IFLOA dd:  directive-statement

.IFNLOA dd:  directive-statement
```

where:

dd:	A device driver
directive-statement	The Indirect command line to be processed if the condition is satisfied.

Examples:

```
.IFLOA DK:  .GOTO 250

.IFNLOA DK:  LOA DK:
```

4.6.18.7 **Test If Symbol Is True Or False** (.IFT/.IFF) - The .IFT or .IFF directive tests whether a logical symbol is true or false. If the test is true, Indirect processes the remainder of the command line.

Indirect exits with a fatal error if the symbol being tested was previously defined as a numeric or string symbol.

Formats:

```
.IFT  ssssss  directive-statement

.IFF  ssssss  directive-statement
```

where:

ssssss	The 1- to 6-character logical symbol being tested.
directive-statement	The Indirect command line to be processed if the condition is satisfied.

Examples:

```
.IFT  A  .GOTO  100

.IFF  B  .GOTO  200
```

4.6.18.8 Compound Tests - You can combine .IF tests by using the .AND and .OR directives. In addition, an implied .AND is effected when more than one .IF appears on the same line without being separated by an .AND directive.

The .AND directive takes precedence over the .OR directive as shown in the following example:

```
.IFT A .OR .IFT B .AND .IFT C .GOTO D
```

That is, Indirect reads the line as:

```
.IFT A .OR (.IFT B .AND .IFT C) .GOTO D
```

Examples:

```
.IFT A .AND .IFF B  .GOTO HELP
```

If the logical symbol A is true and the logical symbol B is false, control passes to the line containing the label .HELP:.

```
.IFT A .IFF B  .GOTO HELP
```

Same effect as the previous directive (.AND implied).

```
.IFT A .OR  .IFF B RUN PIP
```

If the logical symbol A is true or if the logical symbol B is false, the RUN command is issued.

.6.19 Increment Numeric Symbol .INC

The .INC directive increments a numeric symbol by one. Indirect exits with a fatal error if the symbol was previously defined as a logical or string symbol.

Format:

```
.INC ssssss
```

where:

ssssss The 1- to 6-character numeric symbol being incremented.

Example:

```
.INC B
```

Increment by 1 the value assigned to the numeric symbol B.

4.6.20 Define Logical End-of-File /

The logical end-of-file directive (/) terminates file processing and exits. The message

```
>@ <EOF>
```

is then displayed (if display mode has not been disabled).

Format:

```
/
```

as the first nonblank character on a line.

You can use this directive at any location in the command file to quickly terminate file processing, but care should be taken to avoid an inadvertent exit.

Example:

```
        .ASK CONT DO YOU WISH TO CONTINUE
        .IFT CONT .GOTO 100
        /
.100:
```

4.6.21 Branch to Label on Detecting an Error .ONERR

If Indirect detects one of the following errors:

- Task not installed in system (.XQT, .WAIT)
- Undefined symbol
- Bad syntax (.XQT, .WAIT, .DELAY)
- Unrecognized command
- String substitution error
- Symbol type error (.IF, .IFT, .IFF, .INC, .DEC)
- Redefinition of a symbol to a different type (.ASK, .ASKN, .ASKS, .SETT, .SETF, .SETL, .SETN, .SETD, .SETO, .SETS)
- Data file error (.OPEN, .OPENA, .OPENR, .DATA, .CLOSE, or .READ between .ENABLE DATA and .DISABLE DATA)

control passes to the line containing the specified label. This feature provides you with a means of gaining control to terminate command file processing in an orderly manner.

Note that the .ONERR directive applies only to the error conditions listed; errors returned from a task external to Indirect (for example, an MCR syntax error) are not processed by the .ONERR directive.

Format:

```
.ONERR  label
```

Upon detecting an error, the processor passes control to the line starting with .label:. The .ONERR directive must be issued before Indirect encounters the error condition. If the directive is executed (one of the listed errors is encountered), error processing passes to the specified label. If the label specified by the .ONERR directive does not exist and an error condition has occurred, command processing terminates.

Once an .ONERR condition has occurred, another .ONERR directive must be issued to trap a future error.

The .ONERR directive works with the special symbol <ERRCTL> (see Section 4.4.1.2). For each class of error that an .ONERR target routine processes, the appropriate bit is set in the symbol. The initial default value for <ERRCTL> is 1, which implies that only class 1 errors can be handled with an .ONERR routine. (Note that if you attempt to process errors other than default class 1, Indirect cannot continue in most cases. The error service routine is limited to a fatal error message and .EXIT. The internal state of Indirect is indeterminate in all but class 1 error cases.) See Section 4.8 for a list of error messages and their assigned class values.

Example:

```
.ONERR  100
```

Upon detecting one of the error conditions, Indirect passes control to the line labeled .100:.

4.6.22 Open Secondary File .OPEN

The .OPEN directive opens a specified secondary file as an output file. The .DATA directive is used to place data in this secondary file.

Format (brackets not part of syntax):

```
.OPEN [#n] filename
```

where:

filename — A file to be opened as an output file. The default file type is .DAT.

#n — An optional file number in the range 0 to x-1, where x is the number of file-open FDBs specified in the build file for the Indirect task. (x is the maximum number of files that can be open simultaneously.) The default is #0. You can substitute a numeric symbol for the value n by enclosing the symbol in apostrophes.

Note that you cannot include a comment that begins with a semicolon (;comment) in an .OPEN statement. Doing so results in a syntax error. (Comments that begin with an exclamation mark (!comment) are accepted.)

Example:

```
.OPEN SECOUT
```

This directive opens the file SECOUT.DAT as an output file.

4.6.23 Open Secondary File for Append .OPENA

The .OPENA directive opens a secondary file and appends all subsequent data to the file.

Format (brackets not part of syntax):

```
.OPENA [#n] filename
```

where:

filename	A secondary file to be opened with subsequent data appended to it. The default file type is .DAT.
#n	An optional file number in the range 0 to x-1, where x is the number of file-open FDBs specified in the build file for the Indirect task. (x is the maximum number of files that can be open for append simultaneously.) The default is #0. You can substitute a numeric symbol for the value n by enclosing the symbol in apostrophes.

Note that you cannot include a comment that begins with a semicolon (;comment) in an .OPENA statement. Doing so results in a syntax error. (Comments that begin with an exclamation mark (!comment) are accepted.)

If the specified file does not already exist, .OPENA becomes the .OPEN directive by default.

Example:

```
.OPENA SECOUT
```

This directive opens the file SECOUT.DAT as an output file and appends subsequent data to it.

4.6.24 Open File for Reading .OPENR

The .OPENR directive opens a file for reading with the .READ directive.

Format (brackets not part of syntax):

```
.OPENR [#n] filename
```

where:

filename	A file to be opened for reading. The default file type is .DAT.
#n	An optional file number in the range 0 to x-1, where x is the number of file-open FDBs specified in the build file for the Indirect task. (x is the maximum number of files that can be open for reading simultaneously.) The default is #0. You can substitute a numeric symbol for the value n by enclosing the symbol in apostrophes.

Note that you cannot include a comment that begins with a semicolon (;comment) in an .OPENR statement. Doing so results in a syntax error. (Comments that begin with an exclamation mark (!comment) are accepted.)

Examples:

```
.OPENR INDADD
```

This directive opens the file INDADD.DAT for reading with the .READ directive.

```
.OPENR DATLIB.ULB/LB:DATINP
```

This directive opens for reading the library module DATINP that is contained in the universal library DATLIB.

4.6.25 Parse Strings into Substrings .PARSE

The .PARSE directive parses strings in a command line into substrings.

Format:

```
.PARSE <string> <control-string> <var1> <var2> ... <varn>
```

The string is broken up into substrings as specified by the control string. The substrings are stored in the specified variables. The first character of the control string delimits the first substring, the second character of the control string delimits the second substring, and so on. The last character of the control string is repeated if the number of variables exceeds the length of the control string. If you specify more variables than substrings, the additional variables are set to null strings. If you specify less variables than the number of substrings that can be parsed, the last variable contains the unparsed fragment of <string>.

The symbol <STRLEN> contains the actual number of substrings that Indirect processed (including explicit null substrings).

Example:

```
.PARSE COMMAN " ," FILE A1 A2 A3 A4 A5
```

Given that COMMAN contains "TESTFILE IND,MCR,,LOA", this directive has the following results:

```
FILE = TESTFILE
A1   = IND
A2   = MCR
A3   = null
A4   = LOA
A5   = null

<STRLEN> contains a 5.
```

4.6.26 Pause for Operator Action .PAUSE

The .PAUSE directive interrupts processing of an indirect command file to wait for user action. A .PAUSE directive causes Indirect to stop itself. You can then perform some operations and subsequently cause the task to resume.

Format:

```
.PAUSE
```

When Indirect stops itself, it displays the following message on the entering terminal:

```
AT. -- PAUSING.  TO CONTINUE TYPE "command taskname"
```

where:

command The command line to be issued to resume the task.

taskname The name of the Indirect task.

You then type the appropriate command line to resume the task. Indirect then displays the message:

AT. -- CONTINUING

and it continues processing where it left off.

Note that the .PAUSE directive is legal only if the command line interpreter for your terminal is MCR or DCL.

4.6.27 Read Next Record .READ

The .READ directive reads the next record into a specified string variable. The entire record is written into the variable. If the record is longer than 132(10) characters, an error occurs.

After every .READ operation, the special symbol <FILERR> contains the FCS-11 file code for the read and the special symbol <EOF> reflects whether an end-of-file was found. (Note that .OPENR does not clear <EOF>.) If an error or end-of-file occurs, the string variable remains unchanged from its previous state.

Format (brackets not part of syntax):

.READ [#n] ssssss

where:

#n An optional file number that specifies the file from which the record is to be read. The file number must be one of the numbers used in a previous .OPENR statement.

ssssss The string variable into which the record will be read.

Example:

```
        .ENABLE SUBSTITUTION

        .OPENR FILE
        IF <FILERR> NE 1 .GOTO ERROR
.LOOP:
        .READ RECORD
        .IFT <EOF> .GOTO DONE
        .IF <FILERR> NE 1 .GOTO ERROR
        ; 'RECORD'
        .GOTO LOOP
          .
.ERROR:   .
          .

.DONE:  .CLOSE
          .
          .
          .
```

These directives open the file FILE.DAT for reading, read each record into the string variable RECORD, display each record on the terminal, and close the file.

4.6.28 Return from a Subroutine .RETURN

The .RETURN directive signifies the end of a subroutine and returns control to the line immediately following the .GOSUB directive that initiated the subroutine.

Format:

```
.RETURN
```

4.6.29 Set Symbol to True or False .SETT/.SETF/.SETL

The .SETT, .SETF, and .SETL directives define or change the value of a specified logical symbol. If the symbol has not been defined, Indirect makes an entry in the symbol table and sets the logical symbol to the value specified. If the symbol has already been defined, Indirect resets the symbol accordingly. Indirect exits with a fatal error if the logical symbol was defined previously as a numeric or string symbol.

Formats:

```
.SETT  ssssss

.SETF  ssssss

.SETL  ssssss  llllll
```

where:

ssssss	The 1- to 6-character logical symbol to be assigned a true or false value.
llllll	A logical or numeric expression. ssssss is assigned the value of llllll when the logical expression is evaluated.

Examples:

```
.SETT  X
```

This directive sets the logical symbol X to true.

```
.SETF  ABCDE
```

This directive sets the logical symbol ABCDE to false.

```
.SETL  TEST SWITCHA!SWITCHB
```

This directive sets the logical symbol TEST to true if SWITCHA or SWITCHB is true.

4.6.30 Set Symbol to Numeric Value .SETN

The .SETN directive defines or changes the value of a specified numeric symbol. If the symbol has not been defined, Indirect makes an entry in the symbol table and sets the symbol to the numeric value specified. If the symbol has already been defined, Indirect resets the symbol accordingly. Indirect exits with a fatal error if the numeric symbol was previously defined as a logical or string symbol.

Format:

```
.SETN ssssss numexp
```

where:

ssssss	The 1- to 6-character numeric symbol.
numexp	A numeric expression. (See Section 4.4.2.)

When specifying a numeric value to assign to a symbol, you may combine a numeric symbol or constant with another numeric symbol or constant to form a numeric expression. If numeric expressions are used, no embedded blanks or tabs are permitted. Evaluation is done from left to right unless parentheses are used to form subexpressions that are evaluated first. The radix of an expression is octal if all the operands are octal and decimal mode has not been enabled; otherwise the radix is decimal.

Examples:

```
.SETN NUMBER 27
```

This directive assigns to the numeric symbol NUMBER the value 27(8).

```
.SETN A1 3*(A2-5)
```

This directive assigns the numeric symbol A1 the value of symbol A2 minus 5 multiplied by 3.

4.6.31 Set Symbol to Octal or Decimal .SETO/.SETD

The .SETO and .SETD directives redefine the radix of a specified numeric symbol. If the symbol has not been defined, Indirect makes an entry in the symbol table and sets the symbol to the specified radix with a value of 0. If the symbol has already been defined, Indirect resets the symbol accordingly. Indirect exits with a fatal error if the symbol was previously defined as a logical or string symbol.

Formats:

```
.SETO ssssss

.SETD ssssss
```

where:

ssssss	The 1- to 6-character numeric symbol to be assigned an octal or decimal radix.

Example:

```
.SETN A 10      ; Sets symbol A to 10(8)
.SETD A         ; Defines A as a decimal radix symbol with a value
                  of 8(10).
.SETO A         ; Defines A back to original radix with a value of
                  10(8).
```

4.6.32 Set Symbol to String Value .SETS

The .SETS directive defines or changes the string value of a specified string symbol. If the symbol has not been defined, Indirect makes an entry in the symbol table and sets the symbol to the specified string value. If the symbol has been defined, Indirect resets the symbol accordingly. Indirect exits with a fatal error if the symbol was defined previously as a logical or numeric symbol.

Format:

```
.SETS ssssss strexp
```

where:

ssssss The 1- to 6-character string symbol.

strexp Any string expression. (See Section 4.4.3.)

Indirect assigns to the specified symbol the string value represented by the string expression strexp. If a string constant is used in strexp, the constant must be enclosed by quotation marks ("constant").

You can combine a string symbol, constant, or substring with another string symbol or substring by the string concatenation operator (+) to form a string expression.

Examples:

```
.SETS A "ABCDEF"
```

This directive assigns to the string symbol A the string value ABCDEF.

```
.SETS STR2 "ZZZ"
```

This directive assigns string symbol STR2 the value ZZZ.

```
.SETS X STR2+"ABC"
```

This directive assigns string symbol X the value of symbol STR2 plus ABC (that is ZZZABC).

```
.SETS X STR2+A[1:3]
```

This directive is equivalent to the previous directive; it assigns the string symbol X the string value of STR2 plus the first three characters of string A (that is ZZZABC).

```
.SETS MYFILE <UIC>+"MYFILE.TXT"
```

This directive assigns the string symbol MYFILE the string value of the current UIC and the string contained within the quotation marks (for example, if the current UIC is [303,3], MYFILE is assigned the string value [303,3]MYFILE.TXT).

4.6.33 Terminate Command File Processing .STOP

The .STOP directive immediately terminates command file processing and exits. The message

```
>@ <EOF>
```

is then displayed (unless .DISABLE DISPLAY is in effect).

The .STOP directive allows you to optionally set the exit status for Indirect execution.

Format (brackets not part of syntax):

```
.STOP [value]
```

where:

value — An optional numeric expression to serve as the exit status for Indirect. If you do not specify an exit status value, the .STOP directive is identical to the logical end-of-file directive (/).

Example:

```
.STOP 0
```

This directive terminates command file processing and sets the exit status for Indirect to 0.

4.6.34 Test Symbol .TEST

The .TEST directive has two different functions. It tests a variable and sets various special symbols accordingly, and it does substring searches and sets the special symbol <STRLEN> accordingly.

Format 1:

```
.TEST ssssss
```

where:

sssss — The 1- to 6-character symbol to be tested.

The results of the test are as follows:

- If variable is a string, <SYMTYP> is set to 4 and <STRLEN> contains the length of the string. Also, the special symbols <ALPHAN>, <NUMBER>, <RAD50>, and <OCTAL> are set based on a scan of the characters of variable.
- If variable is numeric, <SYMTYP> is set to 2.
- If variable is octal, <SYMTYP> is set to 2 and <OCTAL> is set to TRUE.
- If variable is logical, <SYMTYP> is set to 0.

Format 2:

.TEST string substring

where:

string A string symbol or constant.

substring A string expression.

In this case, the substring is searched for in the specified string. If the substring is present, <STRLEN> is set to the position of the starting character of the substring within the string. If substring is not present, <STRLEN> is set to 0.

Examples:

1. If SUM is a string symbol, the directive statement

```
.TEST SUM
```

sets <SYMTYP> to 4 and places the number of characters represented by the symbol SUM into <STRLEN>.

2. The directive statements

```
.SETS MAIN "ABCDEF"
.TEST MAIN "C"
```

set <STRLEN> to 3, the position of C in the string ABCDEF.

4.6.35 Test Device .TESTDEVICE

The .TESTDEVICE directive allows a command file to acquire information about any device in the system. The information, including error indications, is contained in the string symbol <EXSTRI>. Each device attribute in the string is separated by a comma (which allows processing by the .PARSE and .TEST directives). The first field of the string is the full physical name of the device. The next four fields are octal representations of the device-characteristics words (U.CW1 through U.CW4 of the Unit Control Block). Additional fields contain more information about the device.

Format:

.TESTDEVICE dd[nn]:

where:

dd[nn]: The device about which the command file is requesting information.

The information stored in <EXSTRI> is in the following form:

ddnn:,xx,xx,xx,xx,atr,atr...,atr,

where:

ddnn: The physical device name for the device specified in the command line.

xx,xx,
xx,xx — The four device-characteristics words in octal notation. (See the RSX-11M or RSX-11M-PLUS Guide to Writing an I/O Driver for more information.)

atr — One or more of the following device attributes:

NSD	"No such device" is configured into this system.
LOD	The device driver is loaded.
UNL	The device driver is not loaded.
ONL	The device is on-line.
OFL	The device is off-line.
MTD	The device is a mountable volume and is mounted.
NMT	The device is not a mountable volume or is not mounted.
FOR	The device is a mountable volume and is mounted foreign.
NFO	The device is not a mountable volume or is not mounted foreign.
PUB	The device is a public device.
NPU	The device is not a public device.
ATT	The device is attached to another task.
ATU	The device is attached to this copy of Indirect.
NAT	The device is not attached.
ALO	The device is allocated to another terminal.
ALU	The device is allocated to this terminal.
NAL	The device is not allocated.

<EXSTRI> contains the value "NSD," (no such device) if the device is not present in the current system configuration.

Example:

```
.TESTDEVICE SY:
```

This directive acquires information about user logical device SY: and stores it in <EXSTRI>.

4.6.36 Test a File .TESTFILE

The .TESTFILE directive determines if a specified file exists or it determines the physical device associated with a logical name (that is, performs device translation).

If you specify a file in the command line, the results of a .TESTFILE operation are contained in the symbols <FILSPC> and <FILERR>. <FILSPC> contains the fully qualified file specification and <FILERR> contains the FCS status code resulting from the search for the file.

If you do not specify a file in the command line, Indirect only performs device translation.

Formats:

```
.TESTFILE filespec

.TESTFILE l1:
```

where:

filespec The file to be tested.

ll:	The logical name assigned to be translated to a physical device.

Examples:

```
.TESTFILE MP:IND.MAP
```

This directive assigns the following values if the file exists:

```
<FILERR> = 1
<FILSPC> = DR1:[101,300]IND.MAP;4 (MP: is the logical name
           assigned to the physical device DR1:.)
```

If the file does not exist, the directive assigns the following values:

```
<FILERR> = 346 (230 decimal)
<FILSPC> = DR1:[101,300]IND.MAP;0
```

The following directive tranalates the logical name TI: into its physaical device name.

```
.TESTFILE TI:
```

The directive assigns the symbol values as follows:

```
<FILERR> = 1
<FILSPC> = TT23:.DAT;0
```

4.6.37 Test a Partition .TESTPARTITION

The .TESTPARTITION directive allows a command file to obtain information about a partition in the system. The partition can be the one in which Indirect is running or any other partition. You can use the directive to verify that a partition is large enough before installing a task in it or that the partition is present before loading a special system. Indirect returns the information (in the special symbol <EXSTRI>) in the following format:

```
partition-name,base,size,type,
```

where base and size are in 64-byte blocks and type is SYS for system-controlled partitions, USR for user-controlled partitions, or NSP for an unknown partition name. If the partition is not found, Indirect returns a "No Such Partition" error in the form:

```
partition-name,,,NSP,
```

Format:

```
.TESTPARTITION partition-name
```

where:

partition-name	A 1- to 6-character legal partition name. If you use the wildcard (*) instead of a partition name, Indirect assumes you are testing the same partition in which the current version of Indirect is executing.

Example:

```
.TESTPARTITION GEN
;GEN,1500,2303,SYS,
```

This directive obtains information about the partition named GEN. The partition has a starting address of 150000(8), it is 230300(8) bytes long, and it is a system-controlled partition.

4.6.38 Wait for a Task to Finish Execution .WAIT

The .WAIT directive suspends processing of an indirect command file until a particular task has terminated.

Format:

```
.WAIT  taskname
```

where:

taskname A 1- to 6-character legal task name.

If the task name is omitted, Indirect assumes the task name applied by the last "RUN task" command. This name is specified as

```
TTnn
```

where:

TT The invoking terminal.

nn The terminal number.

The .WAIT directive also sets the symbol <EXSTAT> with the exit status of the completed task.

If the specified (or default) task is not installed, Indirect ignores the .WAIT directive. The .WAIT directive performs no function if the /NOCLI or /NOMC switch is in effect.

Example:

```
.WAIT  PIP
```

This directive discontinues processing of the command file until the terminal-initiated task PIP exits.

4.6.39 Initiate Parallel Task Execution .XQT

Indirect usually passes a command to the CLI and waits until the command's execution has completed. However, it is possible for Indirect to initiate a task and not wait for it to complete before executing the next directive. The .XQT directive allows you to start a task, to pass a command line to it, and to continue processing in parallel with the initiated task. (In MCR, you can also use the RUN /CMD="command-line" command to pass command lines to another task.) The maximum number of successive .XQT directives allowed depends on the parameter specified in the build file for the Indirect task.

Format:

```
.XQT  taskname command-line
```

where:

taskname — The name of the task (for example, MAC, PIP, DMO).

command-line — The command line to be executed.

The .XQT directive allows you to initiate parallel processing of tasks. The .WAIT directive can be used to synchronize their execution.

Example:

```
.XQT  MAC TEST,TEST=TEST
.XQT  TKB BLD,BLD=BLD
.WAIT MAC
.WAIT TKB
```

The example starts an assembly and a task build executing in parallel and then waits for the two tasks to complete.

4.7 EXAMPLES

- Invoking Indirect interactively and displaying symbols:

  ```
  >@TI:
  AT.>
  ```

  Specifying @TI: allows you to work with Indirect interactively. When Indirect issues the AT.> prompt, you can enter directive statements, invoke command files, or display the values of special symbols. To display a symbol, use the .ENABLE SUBSTITUTION directive, then request the symbol in the following format:

  ```
  AT.>;'<symbol>'
  ```

- Using an indirect command file:

  A file named ASSEMBLY.CMD contains the following command lines:

  ```
  .ENABLE SUBSTITUTION
  ;'<TIME>'
  MAC @MACASM.CMD
  .EXIT
  ```

  To execute the command file, use the following command line:

  ```
  MCR>@ASSEMBLY
  ```

4.8 INDIRECT MESSAGES

When Indirect encounters an error, it prints the appropriate error message and the command line in which the error occurred. If the line contained a substitution, the line as it appeared before the substitution took place is also displayed.

Section 4.8.1 explains the information-only messages and Section 4.8.2 explains the error messages. The error messages are divided into classes, depending on the level of severity. Class 2 errors can be handled with the <ERRCTL> symbol (see Section 4.4) and class 1 errors can be handled with the .ONERR directive (see Section 4.6.21). Class 0 errors must be corrected outside of Indirect.

4.8.1 Information-only Messages

@ <EOF>

(Class 0) Indirect has reached the end-of-file for the outermost command file and is terminating execution.

AT. -- CONTINUING

Indirect is resuming execution after a .PAUSE or .DELAY directive.

AT. -- DELAYING

A .DELAY directive was just executed, halting the processing of an indirect command file for a specified period of time.

AT. -- INVALID ANSWER OR TERMINATOR

In response to a question from .ASK, you entered something other than Y, N, or null, followed by a RETURN; or you did not enter a numeric value in response to an .ASKN question; or you pressed the ESCAPE key either without escape recognition enabled or as a character other than the first one following the question. The question will be repeated.

AT. -- PAUSING. TO CONTINUE TYPE "command taskname"

Indirect just executed a .PAUSE directive, interrupting processing of an indirect command file to wait for user action.

AT. -- VALUE NOT IN RANGE

The response to an .ASKN or .ASKS question was not within the specified range. Indirect repeats the question.

4.8.2 Error Messages

AT. -- BAD RANGE OR DEFAULT SPECIFICATION

(Class 1) An illegal character was specified as a range or default argument. Only numeric expressions are permitted.

AT. -- COMMAND FILE OPEN ERROR

(Class 2) The file being invoked in an @file or @file/LB:module command line cannot be found or opened.

AT. -- DATA FILE ERROR, CODE x.

(Class 1) Indirect encountered an error while processing an .OPEN, .OPENA, .CLOSE, or .DATA directive or a data mode access to the secondary file. See the IAS/RSX-11 I/O Operations Reference Manual for a definition of the numeric code x.

AT. -- FILE ALREADY OPEN

(Class 1) An .OPEN or .OPENA directive specified a file that was already open.

AT. -- FILE NOT FOUND

(Class 2) An @filename or .CHAIN directive specified an incorrect file name or nonexistent file.

AT. -- FILE NOT OPEN

(Class 1) Indirect encountered a .DATA or .CLOSE directive that did not reference an open file.

AT. -- FILE READ ERROR

(Class 2) An error was detected in reading the indirect command file. This error is usually caused by records that are more than 132(10) bytes long.

AT. -- ILLEGAL FILE NUMBER

(Class 1) The file number in an .OPEN, .OPENA, .OPENR, .DATA, .ENABLE DATA, .READ, or .CLOSE directive is not in the range of 0 through 3.

AT. -- ILLEGAL NESTING

(Class 1) Too many Begin-End blocks have been nested in the indirect command file. The maximum nesting depth is limited to the size of the symbol table.

AT. -- INITIALIZATION ERROR, CODE x.

(Class 0) Indirect failed to complete initialization when you invoked it. The following list gives the meaning of the displayed code number:

1. Unable to acquire system information such as the U/C or device name
2. Impure area setup failed
3. Unable to acquire task-specific information
4. Unable to acquire terminal-type information
5. Unable to acquire the disk name and other information about the system device (SY:)
6. Unable to allocate enough space for command and data I/O buffers. For privileged Indirect tasks, Indirect was not installed with a large enough increment value. The system manager should remove and reinstall Indirect with a larger increment or in a larger partition. For the nonprivileged Indirect task, the EXTEND TASK directive failed to return sufficient space for Indirect to allocate the buffers.
7. Initialization of allocated buffers failed
8. Initialization of the DATA file structures failed
9. Allocation of FCS-11 buffers for data and command lines failed
10. Symbol table initialization failed
11. Initialization cleanup failed
12. Unable to obtain initial command line

>12. Error codes greater than 12 are returned by FMS-11 and other special purpose initialization modules

Error number 6 is the only initialization error that you should encounter. If any other error from 1 through 12 persists, submit a Software Performance Report (SPR) with any other pertinent information.

AT. -- INVALID KEYWORD

(Class 1) An unrecognized keyword (preceded by a period) was specified.

AT. -- LABEL NOT AT BEGINNING OF LINE

(Class 1) The specified label does not start in the first column of the line. All labels must do so.

AT. -- MAXIMUM INDIRECT FILE DEPTH EXCEEDED

(Class 2) An attempt was made to reference an indirect command file at a nested depth greater than the maximum specified in the build file for the Indirect task.

AT. -- NO POOL SPACE

(Class 2) The dynamic memory allocation has been exhausted. Either wait for more pool space to become available or use the MCR SET /POOL command.

AT. -- NULL CONTROL STRING

(Class 1) The control string specified with the .PARSE directive was null (there were no characters between the quotation marks).

AT. -- NUMERIC UNDER- OR OVERFLOW

(Class 2) The evaluation of a numeric expression yielded a value outside the range 0 through 177777(8).

AT. -- REDEFINING A READ-ONLY SYMBOL

(Class 2) An attempt was made to assign a new value to a read-only symbol. Read-only symbols cannot be overwritten.

AT. -- REDEFINING SYMBOL TO DIFFERENT TYPE ssssss

(Class 1) An .ASK, .ASKN, .ASKS, .READ, .SETT, .SETF, .SETL, .SETN, or .SETS directive was used in an attempt to set the specified, already defined symbol to a different type. The first definition of a symbol determines its type (logical, numeric, or string); subsequent value assignments must conform to the original type.

AT. -- .RETURN WITHOUT .GOSUB

(Class 1) A .RETURN directive was specified without a previous call to a subroutine (.GOSUB).

AT. -- SPAWN FAILURE

(Class 1) Indirect could not initiate the execution of a user command task.

AT. -- STRING EXPRESSION LARGER THAN 132. BYTES

(Class 2) An attempt was made to generate a string expression longer than 132(10) characters.

AT. -- STRING SUBSTITUTION ERROR

(Class 1) Indirect encountered an error during a substitution operation. A probable cause for the error is either the omission of a second apostrophe or the specification of a symbol that is not defined.

AT. -- SUBROUTINE NESTING TOO DEEP

(Class 1) The maximum subroutine nesting level was exceeded. The maximum level is specified in the build file for the Indirect task.

AT. -- SYMBOL TABLE OVERFLOW ssssss

(Class 2) The symbol table was full and there was no space for symbol ssssss.

AT. -- SYMBOL TYPE ERROR ssssss

(Class 1) The symbol ssssss was used out of context for its type; for example, a numeric expression referenced a logical symbol. Only symbols of the same type can be compared.

AT. -- SYNTAX ERROR

(Class 2) The format of the specified command line is incorrect.

AT. -- TOO MANY CONCURRENT .XQTs

(Class 1) More than the maximum number of successive .XQT directives allowed by the build file for the Indirect task were issued.

AT. -- UNDEFINED LABEL .label:

(Class 1) The label .label: specified in a .GOTO, .GOSUB, or .ONERR directive could not be found.

AT. -- UNDEFINED SYMBOL ssssss

(Class 1) The symbol ssssss was referenced, but it had not been defined.

APPENDIX A

MCR AND TKTN MESSAGES

Messages from MCR and TKTN appear in this appendix in alphabetical order. Some messages include remedial action to be taken by the user. This is not included with messages for which the required action is obvious or contained in the description of the message.

The XXX in the messages indicates the 3-character component of MCR that detected the error.

11/40 F.P. exception

> **Explanation:** This is a TKTN message. The task encountered a floating point exception while executing on a PDP-11/40 and no SST routine was specified to process the trap.

Aborted via directive or CLI

> **Explanation:** This is a TKTN message. Either an Executive directive or a CLI command issued by another task caused the task to be aborted.

Aborted via CLI

> **Explanation:** This is a TKTN message. A CLI command aborted the task.

XXX -- Account file open failure

> **Explanation:** The account file was open for another user or the disk containing the account file was not mounted.
>
> **User Action:** Reenter the command line.

XXX -- Account file record(s) locked

> **Explanation:** (RSX-11M-PLUS systems only.) An account record could not be accessed.
>
> **User Action:** Reenter the command line.

Accounting sec. pool allocation failure for '<name>'

> **Explanation:** (RSX-11M-PLUS systems only.) This is a TKTN message. The resource accounting system could not find sufficient space in secondary pool to allocate a block.

XXX -- Addressing extensions not supported

Explanation: The command tried to install a task with a VSECT (virtual section) into a system that does not support the feature.

XXX -- Alignment error

Explanation: An attempt was made to create a partition, but the base address or size conflicted with existing partitions or physical memory size.

*** Allocation failure on task account block for '<taskname>'

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. Resource Accounting could not find sufficient space in secondary pool to allocate a Task Account Block for the specified task.

XXX -- Allocation for SYS file exceeds volume limit

Explanation: The system was unable to allocate the system file from the specified block because intermediate bad blocks or end-of-volume was encountered.

XXX -- Ambiguous help qualifier

Explanation: The qualifier does not specify a unique part of the help file.

User Action: Reenter the command line, specifying the qualifier more completely.

XXX -- Ambiguous help synonym

Explanation: The qualifier referenced as a synonym was not unique.

XXX -- Assign failure

Explanation: The HELLO command could not complete login logical assignments.

AST abort. Bad stack

Explanation: This is a TKTN message. An AST cannot be effected because the AST parameters cannot be pushed onto the task's stack.

XXX -- Bad block file corrupt - data ignored

Explanation: The bad block file contained bad data.

XXX -- Bad block file full

Explanation: The disk had more than 102(10) bad regions on it.

XXX -- Bad block header I/O error

Explanation: A write error was detected in writing the bad-block file header.

XXX -- Bad task file VBN, task removed - <taskname>

Explanation: The system removed the specified task because it contained a bad Virtual Block Number (VBN) in its file header. The task image file has probably been corrupted.

XXX -- Base address must be on 4K boundary

Explanation: The base virtual address of the task is not on a 4K boundary. This message applies only to mapped systems.

XXX -- Base mismatch common block <commonname>

Explanation: The base address of the partition, as recorded in the task image, did not match the base address of the common block.

XXX -- Block(s) exceed volume limit

Explanation: The specified block (or blocks) exceeded the physical size of the volume.

XXX -- Boot block write error

Explanation: An error was detected in writing the volume boot block.

XXX -- Booted device cannot be brought online

Explanation: (RSX-11M-PLUS systems only.) There was an error when SAVE attempted to bring either the unit or controller of the booted device on line. The Executive is corrupted, the device driver does not work, or the device does not work. There is no recovery procedure.

XXX -- Booted device's driver not loaded

Explanation: VMR has been used to unload the driver for the system (booted) disk.

XXX -- Booted device not in system -- <dd nnn mmmmmm>

Explanation: When the system was booted, SAVE could not find the booted device (device name dd, physical unit number nnn, CSR mmmmmm) in the system data structures. For example, the system was booted from DB3:, but the system data structures include only DB0: and DB1:.

XXX -- Byte address

Explanation: The address specified as the argument to the DEBUG command was an odd address. For example, the address 3000 is a legal address, but the address 3001 is not.

XXX -- Cannot install privileged task from non-privileged terminal

Explanation: This message applies to multiuser protection systems only. A nonprivileged user attempted to install a privileged task. Only a privileged user can install a privileged task.

XXX -- Cannot LOAD/UNLOAD a pseudo device

Explanation: The device you attempted to load is a pseudo device. You must specify the name of a physical device.

XXX -- Can't read MCR command buffer

Explanation: The UFD was initiated by a RUN command rather than as an MCR command.

XXX -- Checkpoint area too small

Explanation: The area allocated for checkpointing the task was smaller than the partition into which the task was being installed. This message applies only to systems that do not support the dynamic allocation of checkpoint space.

Checkpoint failure. Read error

Explanation: This is a TKTN message. The task could not be read back into memory after being checkpointed.

XXX -- Checkpoint file already in use on device

Explanation: A previous ACS command established a checkpoint file on the volume mounted on the specified device unit. A volume can contain only one checkpoint file.

XXX -- Checkpoint file header I/O error

Explanation: An error was detected in writing the checkpoint file header.

XXX -- Checkpoint file now inactive

Explanation: This message appears after an ACS command has been issued to discontinue a checkpoint file and the file does not contain any checkpointed tasks. The message indicates that use of the file was discontinued immediately after the command was issued. If the file is still in use, TKTN will issue a message when the file is finally discontinued.

*** <ddnn:> -- Checkpoint file now inactive

Explanation: This is a TKTN message. A request to discontinue use of a checkpoint file on device ddnn: has been satisfied. The need to return checkpointed tasks from the discontinued file back into memory caused the delay between the request and this message.

XXX -- Checkpoint file still active

Explanation: The command attempted to dismount a volume that contained an active checkpoint file. The volume cannot be dismounted until the checkpoint file has been discontinued.

User Action: Issue an ACS command to discontinue the file and reissue the DMO command when the system issues a message to indicate that the checkpoint file is inactive.

XXX -- Checkpoint file still in use on <ddnn:>

Explanation: The system cannot be saved because a checkpoint file on the specified device is still active.

User Action: Deallocate the checkpoint file (see the ACS command) and reenter the SAVE command line.

*** <taskname> Checkpoint space allocation failure

Explanation: This is a TKTN message. The checkpoint file did not contain enough space for the specified task to be checkpointed.

XXX -- Checkpoint space too small, using checkpoint file

Explanation: This is a warning message only. The checkpoint space allocated in the task image file is too small for the size of the task (usually because of the /INC keyword). The system supports the dynamic allocation of checkpoint space and will therefore use a checkpoint file to contain the checkpointed task.

*** <taskname> <ddnn:> -- Checkpoint write error

Explanation: This is a TKTN message. A write failure occurred while the system was attempting to checkpoint the specified task.

XXX -- Circular redirect error

Explanation: The attempt to redirect a device would result in a circular list of redirections.

XXX -- CO: redirected to CO:

Explanation: (RSX-11M systems only.) The console output driver is active. If it is not active, the system may be corrupted.

User Action: If it is not active, use the OPEN command to redirect CO: to the terminal from which you are running SAVE.

XXX -- Command input error

Explanation: Circumstances prevented the BROADCAST task from receiving the command line (usually an indirect command file could not be found); or, a system directive or the RUN command, rather than the HELLO command, has initiated the HELLO task; or an error occurred while MOUNT was attempting to read the command line.

User Action: In the case of BROADCAST, reenter the command line.

XXX -- Command I/O error

Explanation: An I/O error was encountered while the command line was being read.

XXX -- Command syntax error

Explanation: The command line had an improper format.

XXX -- Command too long

Explanation: An INI or MOUNT command, including continuation lines, exceeded the maximum length of 512(10) characters.

XXX -- Common block is task partition <commonname>

Explanation: A task's request for access to a common block was rejected because the requested partition was a task partition.

XXX -- Common block not loaded <commonname>

Explanation: The specified common block was linked to the task but had not been installed in the system.

User Action: Install the common block, then install the task.

XXX -- Common block occupied

Explanation: An attempt was made to load a task into a common block that was already occupied.

XXX -- Common block parameter mismatch <commonname>

Explanation: Parameters of a common block did not match those in the task's label block.

XXX -- Common block segment count error

Explanation: The command installed a resident library with overlays, but the number of overlay segments specified in the task header is different from the number specified in the segment descriptors.

XXX -- Common <commonname> not installed from an LB:

Explanation: (RSX-11M-PLUS systems only.) All checkpointable common must be installed from an LB:.

User Action: Remove the common and reenter the SAVE command line.

XXX -- Common, driver or task above system image file limit

Explanation: A system cannot be saved if addresses for a memory-resident structure are higher than the highest address of main memory written to the system image file.

User Action: Use the PAR command to determine the cause of the problem.

XXX -- Could not size booted device

Explanation: (RSX-11M-PLUS systems only.) SAVE recognized the device name as a device that it should be able to size but could not.

CPU time limit exceeded

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. The task exceeded the CPU time limit specified with the /TIME keyword when the task was installed.

XXX -- CTB <name> does not exist

Explanation: (RSX-11M-PLUS systems only.) The Controller Table name specified with the /CTB keyword does not exist in the resident data base.

XXX -- CTB name <name> is a duplicate

Explanation: (RSX-11M-PLUS systems only.) The loadable data base contains a Controller Table (CTB) with a name that is the same as a CTB name in the resident data base. CTB names must be unique.

XXX -- CTB <name> is not supported by driver, not loaded

Explanation: (RSX-11M-PLUS systems only.) The device driver's dispatch table does not have all the Controller Table mnemonics that the rest of the data base (the DCBs and CTBs) implies that it has, or the CTB is defective. A defective CTB may contain a wrong name or its link to the DCB may be wrong.

XXX -- DCB table for CTB <name> is full

Explanation: (RSX-11M-PLUS systems only.) LOAD attempted to write the address of the Device Control Block (DCB) for the loadable data base into the DCB table of the specified resident Controller Table, but there were no null entries in the DCB table. (Refer to the RSX-11M or RSX-11M-PLUS Guide to Writing an I/O Driver.)

XXX -- Data error

Explanation: The specified bad-block number or the specified contiguous region size is too large.

User Action: Reenter a valid number or size.

XXX -- Device attached

Explanation: The specified device cannot be allocated because it is attached to a running task or the CLI command cannot do a /SHOW display because the terminal is attached to another task.

XXX -- Device <ddnn:> has units attached, busy, and/or mounted

Explanation: (RSX-11M systems only.) Device ddnn: is the first or only unit that is attached, mounted, and/or has outstanding I/O. Therefore, the driver cannot be unloaded.

XXX -- Device not allocated to this terminal

Explanation: The command line specified a private device that was allocated to a terminal other than the one from which the command was issued.

XXX -- Device not in system

Explanation: The device specified in the command line is not in the current system configuration.

XXX -- Device <dd:> not in system

Explanation: The specified device driver does not exist in the system, or the data base for the device driver is not in the system or in the driver's task image.

XXX -- Device not mounted

Explanation: The device specified in the file specification was not mounted. In response to a LOAD or UNLOAD command, the system device (LB:) was not mounted.

XXX -- Device not redirectable

Explanation: The specified device cannot be redirected.

XXX -- Device not ready - <ddnn:>

Explanation: The command line specified a volume that was not ready (not up to speed).

XXX -- Device not terminal

Explanation: An attempt was made to set terminal characteristics for or the /TERM keyword was specified for a device that is not a terminal.

XXX -- Device not variable speed multiplexer

Explanation: An attempt was made to set the baud rate for a terminal that was not attached to a DH11 or DZ11 multiplexer.

XXX -- Device offline[-ddnn:]

Explanation: The device specified in the command line, although generated into the system, was not physically present in the host configuration. If the off-line device is a magnetic tape drive, the message includes the device unit.

XXX -- Device write locked - <ddnn:>

Explanation: The command line specified a volume that was write-locked.

XXX -- Directory already exists

Explanation: The requested UFD already exists on the volume.

XXX -- Disk is alignment cartridge

Explanation: The last track on an RK06/07, RL01/02, or RM02/03/05/80/RP07 disk identified the volume as an alignment cartridge, which cannot be initialized as a Files-11 volume. An alignment cartridge is specifically formatted for aligning disk read/write heads.

*** <ddnn:> -- Dismount complete

Explanation: This is a TKTN message. This message indicates that the device requested for dismount is now logically disconnected from the system (that is, all files are deaccessed and the VCB is deallocated).

XXX -- DPB error

Explanation: A bad Directive Parameter Block was created by MCR. This error indicates that the system itself has faulted.

User Action: If the error persists, submit a Software Performance Report (SPR) to DIGITAL.

XXX -- Driver already resident

Explanation: The specified device driver had already been loaded or is permanently resident.

XXX -- Driver being loaded or unloaded

Explanation: The Executive was effecting another request to load or unload the driver.

XXX -- Driver built with wrong Executive STB file

Explanation: The STB file for the driver was not compatible with the current Executive.

XXX -- Driver cannot be unloaded

Explanation: The UNLOAD command attempted to remove a permanently resident device driver (that is, a driver built as part of the Executive).

XXX -- Driver dispatch table is inconsistent

Explanation: (RSX-11M-PLUS systems only.) The device driver's dispatch table is illegally formatted. Refer to the RSX-11M-PLUS Guide to Writing an I/O Driver.

XXX -- Driver load/unload calls not supported

Explanation: The requested driver included the symbols $ddLOA or $ddUNL in its source. These symbols are reserved for future use by the LOAD and UNLOAD commands.

XXX -- Driver not loaded

Explanation: The device driver specified in the UNLOAD command was not resident in memory, or the INI or MOUNT command specified a device for which a driver was not loaded.

XXX -- Duplicate block(s) found

Explanation: A block that had been specified as bad was being defined as bad a second time.

XXX -- Dynamic allocation of checkpoint space not supported

Explanation: (RSX-11M systems only.) The ACS command was issued on a system that did not include support of dynamic allocation of checkpoint space at system generation.

XXX -- Error logging still active

Explanation: A system cannot be saved while error logging is active. Disable error logging and reenter the SAVE command line.

XXX -- Failed to attach device - <ddnn:>

Explanation: The specified device could not be attached.

XXX -- Failed to create directory

Explanation: No space existed on the volume or an I/O error occurred.

XXX -- Failed to enter in MFD

Explanation: No space existed in the Master File Directory (MFD) or on the volume, or an I/O error occurred on the volume.

XXX -- Failed to read bad block file

Explanation: The INI command was unable to read the bad block information from the last track of an RK06/07, RL01/02, or RM02/03/05/80/RP07 disk.

XXX -- Feature not supported

Explanation: The command keyword specified a feature or device that was not incorporated into the system at system generation, or the command itself cannot be used.

XXX -- File <filename> has illegal STB format

Explanation: The driver's STB file contained illegal object code or data.

XXX -- File I/O error nnn.

Explanation: The ACS command detected an error when it tried to allocate or open the checkpoint file. The code nnn. is an FCS error code that defines the cause of the error. See the IAS/RSX-11 I/O Operations Reference Manual.

XXX -- File <filename> not a valid driver task image

Explanation: The driver's task image was either overlaid or had a task header.

XXX -- File not contiguous

Explanation: An attempt was made to boot a system or install a task from a noncontiguous file. System images and task images must be contiguous.

XXX -- File <filename> not contiguous

Explanation: The file specified was not contiguous. The file must be contiguous.

XXX -- File not found

Explanation: The requested file was not in the directory on the specified volume.

XXX -- File not in use

Explanation: A checkpoint file was not in use on the device specified in the ACS command.

XXX -- File not properly closed

Explanation: An attempt was made to install a file that was not properly closed (that is, locked). Since the file is locked, it is probably corrupted. Install a new copy of the file.

XXX -- File not task image

Explanation: Data in the label block was not correct, indicating that the file was not a valid task image.

XXX -- Home block allocate write error

Explanation: A write error occurred while the system was overwriting a bad home-block area.

XXX -- Home block I/O error

Explanation: An error was detected in reading or writing the volume home block.

XXX -- Home block read error

Explanation: (RSX-11M systems only.) The home block of the booted device could not be read. Try another drive. If unsuccessful, the disk has been corrupted or the area of the home block is bad. This error halts the system.

XXX -- Illegal device <ddnn:>

Explanation: The device specified at task-build time by the assign (ASG) option does not exist in the system. This is a warning message only.

XXX -- Illegal device specified

Explanation: The specified device was not a terminal.

XXX -- Illegal device/volume

Explanation: The specified device was not a valid task-residence device.

XXX -- Illegal driver task APR usage

Explanation: A device driver must be built for APR 5 and must be less than 8K (for example, PAR=DRVPAR:120000:40000). This message applies to mapped systems only.

XXX -- Illegal first APR

Explanation: A privileged task, built to run using APR 4 or 5 as its base, was too large. Using APR 4, the task was larger than 12K; using APR 5, the task was larger than 8K.

If the Executive has been built to support 20K of address space, APR 5 is the only valid base APR for tasks mapping into the Executive. A privileged task that does not map into the Executive must use APR 0 as its base. (See the RSX-11M/M-PLUS Task Builder Manual for a description of the /PR keyword.)

This message applies only to mapped systems.

XXX -- Illegal function

Explanation: A command was entered that MCR could not recognize or an inappropriate keyword was specified.

XXX -- Illegal keyword value

Explanation: A string or value entered for a keyword was invalid.

User Action: Enter a legal string or value.

XXX -- Illegal priority

Explanation: The value of the priority in the command was out of range (that is, not 1 through 250 decimal).

XXX -- Illegal UIC

Explanation: The command line specified an illegal UIC.

XXX -- Illegal value for symbol <symname> in file <filename>

Explanation: The symbol symname is defined to an illegal value in the file ddDRV.STB. This can occur for several reasons, some general and some specific to individual symbols. For example, symbols cannot have odd values, most symbols cannot be defined as zero, $ddTBL must exist and have a value less than $ddEND, and mapped loadable drivers cannot reference $INTSV.

XXX -- Improper help file format

Explanation: The help file is not in proper format and cannot be used. Either edit the file or reenter it in the proper format.

XXX -- Index file bit map I/O error

Explanation: An error was detected in writing the index-file bitmap.

XXX -- Index file header checksum error

Explanation: While rebooting a saved system, the system detected a checksum error in the file header of the index file. The error causes the system to halt. The disk has probably been corrupted.

XXX -- Index file header read error

Explanation: While rebooting a saved system, the system detected an error in the file header of the index file. The error causes the system to halt.

XXX -- Index file I/O error

Explanation: An error was detected in writing the index-file header.

XXX -- Input I/O error

Explanation: In attempting to read the next command, OPEN detected an error.

XXX -- Insufficient pool space

Explanation: The required amount of pool space was not available.

XXX -- Interrupt vector already in use

Explanation: (RSX-11M systems only.) A driver interrupt vector does not point to one of the nonsense interrupt entries. This message can appear when you issue the LOAD command.

XXX -- Invalid account

Explanation: The name or UIC specified in the command line is not stored in the account file or the password specified does not match the name or UIC given.

XXX -- Invalid address

Explanation: The address specified as an argument by the OPEN command referenced a nonexistent memory location, an address outside of the specified partition, or an address outside of the task's virtual address space.

XXX -- Invalid driver data base at offset <xxxx> in file <filename>

Explanation: The driver had an invalid data base value at offset xxxx relative to the symbol $ddDAT.

XXX -- Invalid keyword

Explanation: A keyword was specified in the command line that cannot be used with the command.

XXX -- Invalid interrupt vector

Explanation: (RSX-11M systems only.) The interrupt vector address specified in the driver data base was too high for the current system.

XXX -- Invalid load device

Explanation: The BOOT or INSTALL command detected a device that was invalid as a system- or task-residence device.

XXX -- Invalid speed

Explanation: The multiplexer line does not support the requested speed, or the command line specified unequal receive and transmit baud rates for a DZ11 or DZV11. The DZ11 and DZV11 do not support split speeds.

XXX -- Invalid time parameter

Explanation: A specified time field was incorrect.

XXX -- Invalid UIC

Explanation: A value of zero was detected for either the group number or the member number.

IOT execution

Explanation: This is a TKTN message. The task executed an IOT instruction and no SST routine was specified to process the trap.

XXX -- I/O error sizing device - <ddnn:>

Explanation: The system encountered an I/O error while sizing an RF11 disk.

XXX -- KRB <name> not in loadable data base

Explanation: (RSX-11M-PLUS systems only.) You are attempting to load the driver for a MASSBUS device with a loadable data base. The special symbol (KRBnsme), which defines the location of the KRB, is not defined in the loadable data base. Refer to RSX-11M-PLUS Guide to Writing an I/O Driver.

XXX -- KRB table of CTB <name> will not accept KRB <name>

Explanation: (RSX-11M-PLUS systems only.) You are attempting to load the driver for a MASSBUS device with a loadable data base. If this operation is to be successful, two conditions must exist:

1. The appropriate slot in the CTB (controller table) must exist.
2. The slot in the CTB must be unused.

When you get this error message, one of these conditions does not exist. Refer to the RSX-11M-PLUS Guide to Writing an I/O Driver.

XXX -- Label block I/O error

Explanation: In saving the system image, the SAVE command writes the transfer address in the label block of the system image file. An error occurred during this write attempt. The disk could be corrupted.

XXX -- Label block read error

Explanation: The BOOT command could not read the label block of the system image.

XXX -- Length mismatch common block <blockname>

Explanation: The length parameter for the common block, as described in the label block for the task image, did not match the corresponding length parameter defined in the system. A task's label block data must match system data for that task before it can be installed.

XXX -- Line not DZ11

Explanation: The command attempted to set to remote a line that was not attached to a DZ11 multiplexer.

XXX -- Listing device not available

Explanation: The device unit on which MCR was attempting to display information was attached and unavailable for use.

XXX -- Load device not LB:, task removed - <taskname>

Explanation: The system removed the specified task while saving a system because the task had not been installed from LB:.

Load failure. Read error

Explanation: This is a TKTN message. The task could not be loaded because of a hardware error.

XXX -- Loadable driver support not in system

Explanation: The system generation option to support loadable device drivers was not chosen or necessary routines are not in the Executive.

XXX -- Logical device not in system

Explanation: The specified logical device name was not defined in the logical device tables.

XXX -- Logins are disabled

Explanation: The system was in the process of shutting down or the command SET /NOLOGON has been issued. A user cannot log in at these times.

XXX -- LUN out of range

Explanation: An attempt was made to reassign a LUN that was greater than the maximum number of LUNs allocated to the task when it was built.

XXX -- Magtape label must be specified

Explanation: An INI command attempted to initialize a magnetic tape without specifying the required volume label.

XXX -- Magtape device error - <ddnn:>

Explanation: While positioning a magnetic tape before initializing it, the system encountered an I/O error.

XXX -- Magtape write error - <ddnn:>

Explanation: While writing to the magnetic tape during initialization, the system encountered an I/O error.

XXX -- MCR is not installed

Explanation: When a system is booted, SAVE uses MCR to mount the system disk. Use VMR to install the MCR... task.

*** Memory parity error in partition '<pname>'

Explanation: This is a TKTN message. The error logging subsystem detected a memory parity error in the specified partition.

Memory protect violation

Explanation: This is a TKTN message. The task encountered a memory protect violation and no SST routine was specified to process the trap.

XXX -- Message file error nnn.

Explanation: The system could not open the file LOGIN.TXT for a reason indicated by the FCS code nnn. See the IAS/RSX-11 I/O Operations Reference Manual for a definition of the FCS code.

XXX -- MFD file header I/O error

Explanation: An error was detected in writing the Master File Directory (MFD) file header.

XXX -- MFD write error

Explanation: An error was detected in writing a block to the Master File Directory.

*** Micro code loader not installed

Explanation: This is a TKTN message. For systems that include the KMC11 line printer driver (LKDRV), this message indicates that the task LPINIT is not installed in the system.

XXX -- Must be run from terminal CO:

Explanation: (RSX-11M systems only.) SAVE is not being run from the terminal to which the pseudo device CO: is directed.

XXX -- New device not known to system

Explanation: The new device specified by the REDIRECT command was not known to the system (that is, it does not exist in the device tables).

XXX -- No bad block data found

Explanation: Although automatic bad-block specification was selected, no bad-block file was found on the volume. This is a warning message only.

XXX -- No checkpoint space, assuming not checkpointable

Explanation: This is a warning message only. The command attempted to install the task as checkpointable, but the task was not built as checkpointable and therefore had no checkpoint space allocated in its task image file. Because the system does not support the dynamic allocation of checkpoint space, it considers the task not to be checkpointable.

XXX -- No LUNs

Explanation: A LUN command line specified a task that had no current logical unit number assignments.

XXX -- No pool space

Explanation: The Executive could not currently satisfy MCR's request for dynamic memory.

XXX -- No room available in STD for new task

Explanation: No dynamic memory is available for making an entry in the System Task Directory (STD). The task cannot be installed.

XXX -- No transfer address

Explanation: BOOT did not consider the file to be a system image file because the specified transfer address in the label block appears to be corrupted.

XXX -- No volume list

Explanation: The command line specified a magnetic tape drive for which a mounted volume list does not exist.

XXX -- Non existent memory

Explanation: An attempt was made to define a partition in nonexistent memory.

Non-RSX EMT execution

Explanation: This is a TKTN message. The task executed an EMT instruction having an argument other than 377(8) or, in the case of a privileged task switching to system state, 376(8), and no SST routine was specified to process the trap.

XXX -- Not a system image

Explanation: The BOOT command determined that the file was not a system image.

XXX -- Not a valid save device

Explanation: An attempt was made to save a system on a device that is not part of the syster I/O data structures or SAVE does not support the device.

XXX -- Not enough APRs for task image

Explanation: The Task Builder allows the user to specify the virtual base address of a task image as a multiple of 4K. Privileged tasks that access the Executive start at either virtual address 100000(8) for a 16K Executive or at virtual address 120000(8) for a 20K Executive. If the virtual base address is set too high, there are not enough APRs remaining to map the task image. (See the RSX-11M/M-PLUS Task Builder Manual for information on privileged tasks.) This message applies only to mapped systems.

XXX -- Not file structured device

Explanation: The system does not support Files-11 on the specified device.

XXX -- Not Files-11 device

Explanation: The command line specified a device that did not contain a Files-11 disk. The specified device unit must contain a mounted Files-11 disk.

*** <ddnn:> -- Not ready

Explanation: This is a TKTN message. The specified device was not ready.

XXX -- Null file header I/O error

Explanation: An error was detected in writing null file headers to the index file.

Odd address or other trap four

Explanation: This is a TKTN message. The task executed a word inatruction with an odd address or referenced a nonexistent memory location in an unmapped system, and no SST routine was specified to process the trap.

XXX -- Old device attached

Explanation: An attempt was made to redirect an attached device.

XXX -- Old device mounted

Explanation: An attempt was made to redirect a mounted device.

XXX -- Old device not known to system

Explanation: An attempt was made to redirect an unknown device (the device does not exist in the device tables).

XXX -- Open file(s) on <ddnn:>

Explanation: There are open files on ddnn:. Ensure that the Queue Manager is stopped.

XXX -- Other user logged on

Explanation: Another user is currently logged in on the terminal. Only one user at a time can be logged in on a terminal.

XXX -- Output error

Explanation: An MCR terminal-write operation failed.

XXX -- Overlap seeks not supported

Explanation: The command attempted to enable overlapped seek support for other than a DM or an RH device controller.

XXX -- Parameter conflict with already mounted volume

Explanation: The volume was already mounted foreign and Files-11 access was requested or the volume was mounted Files-11 and foreign access was requested.

Parity error

Explanation: This is a TKTN message. A parity error occurred while the task was executing. The task was fixed in memory so that the memory cannot be reused for another task.

XXX -- Partition already exists

Explanation: An attempt was made to define a partition with a name already in use.

XXX -- Partition busy

Explanation: The partition in which the task was to be fixed was occupied, so the task could not be fixed.

XXX -- Partition <pname> busy

Explanation: (RSX-11M systems only.) The user-controlled partition or subpartition into which the driver was to be loaded was already occupied.

XXX -- Partition <pname> is a common

Explanation: (RSX-11M systems only.) An attempt was made to load a device driver into a common partition. A device driver cannot be loaded into a common partition.

XXX -- Partition not common

Explanation: A partition specified for a common area or library was not defined as a common partition.

XXX -- Partition <pname> not in system

Explanation: (RSX-11M systems only.) The partition specified either in the LOAD command line or at task build was not in the system.

XXX -- Partition <pname> not in system, defaulting to GEN

Explanation: This is a warning message only. The specified partition does not exist, so the system attempts to install the task in the GEN partition.

XXX -- Partition <pname> not in system, task removed - <taskname>

Explanation: (RSX-11M systems only). If a task is installed in more than one system, the Partition Control Block addresses in its header mapping windows may not be for the booted system. The task's label block indicates that the task maps to pname, but pname is not in the current system. The label block has probably been corrupted.

XXX -- Partition/region <pname> not in system

Explanation: (RSX-11M-PLUS systems only.) An attempt was made to load a driver into a partition that does not exist in the system, or LOAD found a symbol $xxCOM in the driver and the region xxCOM does not exist in the system.

XXX -- Partition <pname> too small

Explanation: The partition into which the driver was to be loaded was not large enough to contain it.

XXX -- Partition too small to buffer information

Explanation: The command resulted in excessive output to the buffer. The information in excess of the buffer size is not displayed.

Postmortem Dump not possible

Explanation: This is a TKTN message. A Postmortem Dump was requested (or the task was built specifying a Postmortem Dump), but the dump could not be generated. For example, the PMD task was not installed, the PMD task and the aborted task were in the same partition and not checkpointable, or there was not enough memory available.

Postmortem Dump will be generated

Explanation: This is a TKTN message that indicates that a Postmortem Dump was requested and will be generated.

XXX -- Privileged command

Explanation: A command that is available only to privileged users was issued by a nonprivileged user.

XXX -- Privileged task larger than 12K

Explanation: A privileged task was larger than 12K words. Privileged tasks on an unmapped system have a maximum size of 12K.

XXX -- Proper controllers and/or units are not offline

Explanation: (RSX-11M-PLUS systems only.) When a system is saved, all device units and device controllers except the TI: for DAVE and the load device must be off line. Use the DEVICES or CON DISPLAY command to determine which devices are on line and then issue a CON OFFLINE ALL command.

XXX -- Pseudo device error

Explanation: The specified device is a pseudo device. Pseudo devices cannot be allocated.

XXX -- Pseudo device redirect error

Explanation: An attempt was made to redirect one pseudo device to another pseudo device.

XXX -- Public device [- ddnn:]

Explanation: The command attempted to allocate or initialize a public device. Public devices cannot be allocated or initialized.

*** <ddnn:> -- Read failure. Check hardware status

Explanation: This is a TKTN message. The card reader driver detected a hardware error.

XXX -- Region/partition <name> is a common

Explanation: An attempt was made to load a device driver into a common partition or region. A device driver cannot be loaded into a common partition or region.

***** <ddnn:> -- Remount verification task not installed**

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. An attempt to remount the specified multiunit disk with the remount verification task (VER...) has failed because the task is not installed.

This problem occurs when a disk has been spun down and any I/O in progress to the disk stalled. The disk is then spun back up and the driver tries to request VER... to remount the disk. But because VER... is not installed, the disk cannot be remounted and the stalled I/O cannot complete.

To recover, you must reboot the system. To avoid future recurrences of the problem, install and fix VER... in the system.

*** <ddnn:> -- Replacement control task not installed

Explanation; This is a TKTN message. While bringing the specified device on line or detecting a bad block on the device, the driver could not call the replacement control task (RCT) because it is not installed. Install RCT.

Required bus runs are offline or not present

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. The task, or a common that it is mapped to, was installed with an affinity for a CPU or a bus run that is off line.

Reserved inst execution

Explanation: This is a TKTN message. The task executed an illegal instruction and no SST routine was specified to process the trap.

*** <ddnn:> -- Select error

Explanation: This is a TKTN message. The selected device was not ready or more than one drive had the same unit number.

XXX -- Shadow recording is active on <ddnn:>

Explanation: (RSX-11M-PLUS systems only.) The device specified in a DISMOUNT command line was being used in shadow recording. Shadow devices cannot be dismounted; first stop shadow recording and then reenter the command line.

XXX -- Space used

Explanation: An attempt was made to create a partition or a subpartition in a storage area already occupied.

XXX -- Specified partition for common block

Explanation: An attempt was made to install a task in a common block.

XXX -- Specified partition too small

Explanation: The task being installed was larger than the partition into which it was being installed.

SST abort. Bad CSM parameters

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. The task executed a CSM (Call to Supervisor Mode) instruction with invalid parameters.

SST abort. Bad stack

Explanation: This is a TKTN message. An SST cannot be effected because the SST parameters cannot be pushed onto the task's stack, or a stack overflow was detected in an unmapped system, as indicated by a nonzero value in the header guard word.

XXX -- Storage bitmap file I/O error

Explanation: An error was detected in writing out the storage allocation file header.

XXX -- Symbol <symname> is doubly defined by file <filename>

Explanation: The symbol symname is defined twice in the specified file. Duplicate symbols are illegal.

XXX -- Symbol <symname> is undefined in file <filename>

Explanation: The symbol symname was found in the specified file, but the symbol was not defined.

XXX -- Syntax error

Explanation: This message generally indicates that the required information was entered incorrectly.

User Action: You can usually correct this condition by retyping the arguments according to the command specifications.

XXX -- System may not boot correctly

Explanation: The file [system-uic]SAV.TSK was not found on the boct device. If SAVE must be checkpointed to redirect and mount the booted device, the system disk will be overwritten, causing unpredictable results.

XXX -- System may not work - corrupted file for common <commonname>

Explanation: (RSX-11M-PLUS systems only.) When SAVE attempted to convert the file-ID for the common, SAVE found that the task image of the checkpointable common was corrupted or had been deleted. SAVE altered the system data structures to prevent checkpointing of the common into what may now be another task image.

XXX -- Task active

Explanation: The task used as the argument of the command was active.

XXX -- Task active in another system, task removed - <taskname>

Explanation: The task is installed in another system as well as in the booted system. Since taskname is active and mapped to dynamic regions in the other system, it cannot be run in the booted system.

XXX -- Task already fixed

Explanation: The task used as the argument of the FIX command is already fixed in memory.

XXX -- Task and partition bases mismatch

Explanation: The base of the partition did not match the base of the task being installed. This message applies only to unmapped systems.

XXX -- Task and partition <pname> bases mismatch

Explanation: The base address of the partition into which the driver was to be loaded did not match the base address of the partition for which the task was built. This message applies to unmapped systems only.

XXX -- Task being aborted

Explanation: A request for the execution of a task was made, but the task was being aborted either because of an unrecoverable error or an abort command or directive issued by a user.

XXX -- Task being fixed

Explanation: An attempt was made either to fix or to alter the priority of a task that was already being fixed.

XXX -- Task checkpointable

Explanation: An attempt was made to fix a checkpointable task in memory. A checkpointable task cannot be fixed in memory.

Task exit with outstanding I/O

Explanation: This is a TKTN message. The task exited with one or more outstanding I/O requests. Tasks should terminate all I/O operations before exiting. The system does, however, process all outstanding I/O.

XXX -- Task file deleted, task removed - <taskname>

Explanation: While rebooting a saved system, a file identification that appears in the Task Control Block (TCB) could not be found in the index file on the boot device. This indicates that the file has been deleted.

XXX -- Task file header error, task removed - <taskname>

Explanation: When SAVE read the task header to restore the LBN of the task file, the checksum was bad or there was a file number mismatch. Therefore, the task was removed.

XXX -- Task file header read error, task removed - <taskname>

Explanation: The system removed the specified task because it encountered a failure while reading the task's file header.

XXX -- Task header read error

Explanation: The system detected an I/O error while reading in a task header to write the file identification into the TCB. This error causes the system to halt.

XXX -- Task image already installed

Explanation: The requested task image, which was checkpointable, had already been installed. On systems that do not support the dynamic allocation of checkpoint space, checkpointable tasks that do not have checkpoint space allocated can be installed only once; other tasks can be installed more than once (under different names).

XXX -- Task image I/O error

Explanation: INSTALL could not read the task image file or it could not rewrite the task image header. (The device is write-locked.)

XXX -- Task image I/O error in file <filename>

Explanation: The device is probably write-locked. MCR could not read the task image file or could not rewrite the task image header.

XXX -- Task image virtual address overlaps common block <blockname>

Explanation: The virtual addresses reserved for the task image overlap those reserved for the common block specified in the message. A corruption of the task image file probably caused the overlap.

Task installed in more than one system

Explanation: This is a TKTN message. The task image file has been installed in more than one system. The task's header contains pointers for the last system in which the task was installed. The pointers are not valid for the current system. Remove the task and reinstall it in the current system.

XXX -- Task installed in partition

Explanation: An attempt was made to eliminate a partition or subpartition that contains installed tasks.

Task load device dismounted

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. The task cannot be loaded into memory because its load device has been dismounted.

XXX -- Task marked for abort

Explanation: A previous request has already been made to abort the specified task, but the abort has not yet occurred. The task marked for abort is probably not currently resident in memory or it has outstanding I/O.

XXX -- Task name already in use

Explanation: An attempt was made to install a task with the same name as one already in the system.

XXX -- Task not active

Explanation: The specified task is not currently active.

XXX -- Task not fixed

Explanation: An attempt was made to unfix a task that was not fixed or to open a virtual location of a task that was not fixed.

XXX -- Task not in system

Explanation: The specified task has not been installed or the task was initiated by the install-run-remove option of the RUN command.

XXX -- Task not suspended

Explanation: The task specified in the RESUME command line was not suspended.

*** Task "<taskname>" does not contain a debugging aid

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. The DEBUG command was issued for a task that does not contain a debugging aid.

XXX -- Task <taskname> has outstanding I/O

Explanation: A system cannot be saved if a task is waiting for I/O to complete.

XXX -- Task <taskname> is active and checkpointed

Explanation: You cannot save a system if it contains an active and checkpointed task. This restriction prevents a possible system crash because, if the task was installed in another system image file, the task image could be corrupted when the task was run in the second system.

XXX -- Task <taskname> is connected to an interrupt vector

Explanation: Disconnect the task from the interrupt vector or abort it, and reenter the SAVE command line.

XXX -- Task <taskname> not installed from an LB:

Explanation: All tasks must be installed from the system device (LB:). Use the TAS command to determine which tasks are not installed. Reenter the SAVE command line after removing the tasks or installing them from LB:.

T-bit trap or BPT execution

Explanation: This is a TKTN message. The task has either set the T-bit in the Processor Status Word or executed a Breakpoint Trap instruction, and no SST routine was specified to process the trap.

XXX -- Terminal allocated to other user

Explanation: The issuing terminal is already allocated to another user. A user cannot log in on a terminal allocated to someone else.

XXX -- TI redirect error

Explanation: An attempt was made to redirect the pseudo device TI:. This device cannot be redirected.

TI: virtual terminal eliminated

Explanation: (RSX-11M-PLUS systems only.) This is a TKTN message. The terminal from which the task was initiated (its TI:) was a virtual terminal that has since been eliminated. This happens to an offspring task when its parent task issues an ELIMINATE VIRTUAL TERMINAL directive and exits or aborts. The offspring task cannot continue running without a TI: and is aborted.

XXX -- Too many common block requests

Explanation: A task is limited to seven common block requests.

XXX -- Too many LUNs

Explanation: A task attempted to assign more than 255(10) LUNs.

XXX -- Too many subpartitions

Explanation: An attempt was made to assign more than seven subpartitions. A partition is limited to a maximum of seven subpartitions.

XXX -- Too many symbols of the form $xxTMO in file <filename>

Explanation: (RSX-11M-PLUS systems only.) LOAD is attempting to extract symbols of the form $xxTMO from the driver's symbol definition file. There are more symbols of this form than LOAD can process.

TRAP execution

Explanation: This is a TKTN message. The task executed a TRAP instruction and no SST routine was specified to process the trap.

XXX -- Undefined common block <blockname>

Explanation: A task referenced a common block that had not been defined in the system. Usually, this message indicates that the task was built for another system.

XXX -- Undefined density selection

Explanation: The command line specified an illegal density value.

XXX -- Unit does not support 800 bpi

Explanation: The command line specified 800 bpi for a drive that does not support 800 bpi.

XXX -- Unit does not support 1600 bpi

Explanation: The command line specified 1600 bpi for a drive that does not support 1600 bpi.

XXX -- Unit does not support 6250 bpi

Explanation: The command line specified 6250 bpi for a drive that does not support 6250 bpi.

XXX -- Unit does not support density switch

Explanation: The command line specified multiple densities for a device that does have multiple-density capability.

XXX -- Unit does not support HIGH/LOW density selection

Explanation: The command line specified HIGH or LOW density for a device for which the HIGH and LOW options are undefined.

XXX -- Unit is not at LOW density

Explanation: The command line specified that a floppy disk in an RX02 drive be initialized at LOW density, but the floppy was formatted at HIGH density.

XXX -- Unit is not at HIGH density

Explanation: The command line specified that a floppy disk in an RX02 drive be initialized at HIGH density, but the floppy was formatted at LOW density.

XXX -- Unknown main partition

Explanation: An attempt was made to define a subpartition in a nonexistent main partition.

XXX -- Unknown help qualifier

Explanation: The help file does not contain the last qualifier displayed in the command line below the error message.

*** <ddnn:> -- Unrecoverable hardware device error

Explanation: This is a TKTN message. Error Logging recorded an unrecoverable hardware error.

XXX -- User logged on terminal

Explanation: The command attempted to allocate a terminal that has been logged in by another user. Logged-in terminals cannot be allocated.

XXX -- User partition >32K not permitted

Explanation: (RSX-11M systems only.) The command attempted to create a partition greater than 32K. User-controlled partitions greater than 32K cannot be created in systems that do not support extended logical address space, a system generation option.

XXX -- Volume mounted Files-11

Explanation: An attempt was made to initialize a mounted Files-11 volume. Mounted Files-11 volumes cannot be initialized.

XXX -- Volume mounted foreign with ACP

Explanation: (RSX-11M-PLUS systems only.) The command line specified a device that was mounted foreign but with an ACP. To initialize a volume on RSX-11M-PLUS, you cannot include an ACP name when the volume is mounted as foreign.

XXX -- Volume name too long - (volume name)

Explanation: The command line specified a volume label that exceeded six characters for magnetic tape devices or 12(10) characters for disk or DECtape devices.

XXX -- Volume not mounted

Explanation: An attempt was made to dismount or to create a UFD on a volume that is not mounted. A volume on which a UFD is to be created must be mounted.

XXX -- Volume not mounted by TI:

Explanation: The command line specified a dismount operation for a volume that was not mounted from the issuing terminal or the command line specified the wrong device name for a magnetic tape set.

XXX -- Volume(s) still mounted on <ddnn:>

Explanation: A system with mounted volumes cannot be saved.

User Action: To correct the problem, dismount the volumes and retry the command. The DEVICES command can be used to display the mounted volumes.

XXX -- Volume structure not supported

Explanation: RSX-11M/M-PLUS does not support the Files-11 structure level of the volume being mounted.

In response to a SAVE command, while rebooting a saved system, the system determined from the disk's home block that the disk's structure is not supported by the current version of RSX-11M/M-PLUS. This error causes the system to halt.

XXX -- Warning -- Block 0 is bad

Explanation: Block 0 of the specified volume, the boot block, was bad. A bootable image cannot be placed on this volume. This is a warning message only.

XXX -- Warning - KRB <name> interrupt vector nnn in use

Explanation: (RSX-11M-PLUS systems only.) An attempt was made to load a driver that specifies an interrupt vector that is not pointing to a nonsense interrupt entry point address. This is usually caused by a previously loaded driver that has used this vector.

When you get this message, LOAD has loaded the driver correctly, but the problem must be corrected before the device is brought on line.

XXX -- Warning - KRB <name> interrupt vector <nnn> too high

Explanation: (RSX-11M-PLUS systems only.) An attempt was made to load a driver that specifies an interrupt vector address that is higher than the highest permissible vector address in your system.

When you get this message, LOAD has loaded the driver correctly, but the problem must be corrected before the device is brought on line.

XXX -- Warning - Loadable driver larger than 4K

Explanation: Loadable drivers can be up to 8K words in length. The driver must explicitly map to any locations above 4K words.

XXX -- (Warning) Nonexistent LUN assignment for task <taskname>

Explanation: The physical device to which SAVE was attempting to reassign a LUN does not exist in the booted system. This condition is resolved if the task performs a run-time assignment to the LUN; otherwise, the task will encounter an error condition when it attempts to use the LUN.

XXX -- Warning - Privileged task overmaps the I/O page

Explanation: A privileged task that is mapped into the Executive is usually also mapped into the I/O page to access the registers for the KT11 and other devices. Many tasks do not require this access and can use the additional 4K words of virtual address space for the task image. This message warns that a task that may require access to the I/O page might have grown too large.

XXX -- Write attributes failure

Explanation: An error was encountered while the attributes of either the MFD or the newly created UFD were being written.

*** <ddnn:> -- Write back caching data lost. Unit write locked

Explanation: This is a TKTN message. When the specified device was brought on line, RCT detected that its cache contained corrupted data, so the device was write-locked for protection. After correcting the cache data, mount the device as write-enabled (MOUNT /WRITE).

Note that every time the device is brought on line, TKTN will display this message.

XXX -- Write check not supported

Explanation: An attempt was made to support write checking on a device that does not support it.

XXX -- Wrong volume label

Explanation: The volume's current label and the label specified in the command line did not match.

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